



Delft University of Technology

A visit to Cornell University, Ithaca, USA

Notes on the International Workplace Studies Program IWSP

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September 29 – October 31, 2004

Notes

A visit to Cornell University

Ithaca, New York



Theo J.M. van der Voordt

Delft University of Technology

Faculty of Architecture

Department of Real Estate & Housing

Executive Summary

In October 2004 I had the opportunity to visit Cornell University in Ithaca, New York. The purpose of my visit was to learn more about the International Workplace Studies Program (IWSP) that was launched in 1989 by Franklin Becker and William (Bill) Sims. Frank is the present chair (Bill the former) of the Department of Design and Environmental Analysis (DEA) of the College of Human Ecology. The mission statement of IWSP is to generate research-based information related to the planning, design, and management of facilities that can contribute to the development of more competitive and effective organizations. The focus is on new ways of working and new integrated workplace strategies. A considerable number of case studies have been executed on the effects of non-territorial offices and teleworking - at home, with the client, in a hotel, in a telework center - on communication, social cohesion, collaboration, attraction and retaining staff, turnover, productivity, and facility costs. Most studies include an extensive review of literature, a user survey with web-enabled questionnaires, interviews with focus groups, observations and analysis of documents.

Two overall conclusions are coming up. First of all the need for an integral approach of "The Total Workplace". This concept refers to: 1) the idea of integrating decisions often considered in isolation by different departments (HRM, IT, design and construction, and buildings operations and management); 2) the idea that the workplace is more than one's own personal office or workstation, it is the entire workplace (site, amenities, common areas, project rooms, support areas), a "series of loosely coupled settings"; 3) the idea that the processes used for planning, designing, and managing the workplace are as much a part of the building's quality as are its physical characteristics. A second conclusion is the great value of face-to-face contacts to tacit learning, building trust and social cohesion, and young employees' learning on the job by becoming an "insider".

The IWSP-research improves our understanding of what is really going on in the offices of our times. The empirical data can be used as a mirror for managers to take well-informed decisions. But the data don't give us a blueprint how a well performing office should be. Contextual differences with reference to organizational characteristics, working processes, the cultural and economic context, and differences with regard to demographics (age, gender, ethnics) and jobs require more or less a tailor made approach. But taking into account all key findings and lessons learned, decision makers can reduce the risk of "wrong" decisions and improve the probability of positive outcomes. An interesting tool to support complex decisions in accommodating change is the so-called Cornell Balanced Real Estate Assessment Model (COBRA[®]), a prototype tool, including investment and operational costs, exit costs, key human resource factors, and measures of uncertainty. The COBRA tool may be used to quantify the implications of different assumptions and decisions. For instance the % of productivity increase that is needed to compensate for the high cost of collocating a faculty, or the reduce in turnover to compensate the cost of employee services. It is in particular the combination of soft and hard data and "dollar-metrics" that makes the tool very helpful.

This report summarizes the main findings of four weeks of talking, reading, and reflecting. Apart from the discussions with Franklin Becker and William Sims, I had also the opportunity to talk with their colleagues Alan Hedge, Lorraine Maxwell and Nancy Wells, with Stephani Robson of the Hotel School, with Robert Abrams of the two-year master's degree program Real Estate, and, be it briefly, with Mohsen Mostafavi, the brand new Dean of the College of Architecture, Art, and Planning. I am utmost grateful for the time they spend with me to improve my knowledge. With great pleasure I will pass on my own lessons learned to the staff and students in Delft. If possible at all: see you again, folks!

Theo van der Voordt, Ithaca/Delft

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1. Cornell University in Ithaca, New York

www.cornell.edu

"I would found an institution where any person can find instruction in any study".
Ezra Cornell, 1865.

Founded in 1865 by Ezra Cornell and Andrew Dickson White
Opened October 7, 1868 (412 students)
More than 260 buildings on 750 acres (300 ha)

Private endowed university; Partner of the State University of New York;
Member of the Ivy League

7 undergraduate units + 4 graduate and professional units
2 medical graduate/professional in New York City, 1 in Qatar

One university, seven colleges

College of Arts and Sciences
College of Agriculture and Life Sciences
College of Architecture, Art, and Planning
College of Engineering
School of Hotel Administration
College of Human Ecology
School of Industrial and Labor Relations

Student enrollment, fall 2003

| | |
|------------------------------------|--------|
| Total undergraduate | 13,655 |
| Total graduate/professional Ithaca | 5,965 |
| Other | 714 |
| Total university | 20,334 |

Degrees granted 2002-2003

Bachelors 3,630; Master's 1,550; Doctoral 434

Total university faculty 3,129; Total university staff 8,739
\$ 504,6 million research expenditures

Undergraduate enrollment

| | |
|--|--------|
| College of Agriculture and Life Sciences | 3,035 |
| College of Architecture, Art, and Planning | 567 |
| College of Arts and Sciences | 4,401 |
| College of Engineering | 2,681 |
| School of Hotel Administration | 793 |
| College of Human Ecology | 1,312 |
| School of Industrial and Labor Relations | 814 |
| Internal Transfer Division | 43 |
| TOTAL UNDERGRADUATE | 13,655 |

Graduate / professional enrollment

| | |
|---------------------------------------|-------|
| Graduate School | 4,396 |
| Law School | 584 |
| Johnson Graduate School of Management | 653 |
| College of Veterinary Medicine | 332 |
| TOTAL ITHACA | 5,965 |

Faculty

| | |
|-----------------------|-------|
| Non-medical divisions | 1,544 |
| Medical Divisions | 1,585 |
| TOTAL UNIVERSITY | 3,129 |

Staff

| | |
|-----------------------|-------|
| Non-medical divisions | 7,131 |
| Medical divisions | 1,608 |
| TOTAL UNIVERSITY | 8,739 |

Tuition and Student Activities Fee 2004-2005

| | |
|---------------------------------|-----------|
| Architecture, Art, and Planning | \$ 30,167 |
| Hotel Administration | \$ 30,167 |
| Human Ecology | |
| Resident | \$ 16,037 |
| Non-resident | \$ 28,567 |

Estimated Living Expenses 2004-2005

| | |
|--------------------|----------|
| Housing | \$ 5,875 |
| Dining | \$ 4,058 |
| Books and supplies | \$ 660 |
| Personal expenses | \$ 1,340 |
| Travel expenses | pm |

2. College of Human Ecology

www.human.cornell.edu

170 Martha Van Rensselaer Hall, Ithaca, New York, 14853-4401

Undergraduate student enrollment, fall 2003: 1,312

Four areas of study

nutrition and health; human development and the life courses; economic and public policy; design and technology

Majors

- Policy Analysis and Management
- Human Biology, Health and Society
- Nutritional Science
- Human Development
- Apparel and Textile Management
- Fiber Science
- Interior Design
- Facility Planning and Management
- Human Factors / Ergonomics

Underscored = Department of Design and Environmental Analysis (DEA)

Students

1,382 undergraduates
207 graduates
22,246 living alumni

Faculty

91 professors
19 lecturers
46 extension associates
28 research associates

Undergraduate 4 years
15 credits / semester, total 120 credits

Design and Environmental Analysis: 120-130 students

3 options

| | |
|----------------------------------|-------------|
| Interior Design | 60 students |
| Facility Planning and Management | 30-35 |
| Human Factors / Ergonomics | 25-30 |
| Total | 120-130 |

Ca 15% continue with a MSc of 1-2 years

3. International Workplace Studies Program (IWSP)

IWSP.human.cornell.edu

IWSP Mission: to generate research-based information related to the planning, design, and management of facilities that can contribute to the development of more competitive and effective organizations.

1993: introduction of *IWS = Integrated Workplace Strategy*

3.1 Franklin Becker

fdb2@cornell.edu; Phone: home 607.532.4907; mobile 607.351.2893; work 607.255.1950
BSc (1968) in psychology, University of California at Davis; MSc from Boston University; .
PhD (1970) in social and environmental psychology, University of California, Davis.

Professor of human-environment relations and facility management.

Chair of the Department of Design and Environmental Analysis, College of Human Ecology.
Director of the International Workplace Studies Program (IWSP), formerly the International Facility Management program, launched in 1989, supported by a consortium of private and public sector organizations in the United States, United Kingdom, Europe and Japan.
Principal of @WORK, a consulting group, and founder and director of IDEAworks LLC, a management firm that works with Fortune 500 companies.

Teaching

DEA 453 Planning and managing the workplace. Mo + we 2.55 – 4.10 h

DEA 653 ditto; Tue 7.30 – 10.30 pm

DEA 451/659 Introduction to Facility Planning and Management: Tue 3.35 – 4.25

Summary of Lecture October 5 on Workplace Change Management

Aws = alternative workplace strategies

Asa = alternative space arrangements (See paper of Jim Robertson)

Main driver often cost reduction

Resistance to change: loss of status, professional identity, confidentiality

Start change management right from the beginning!

Typology of research methods: employee surveys, interviews, focus groups, full-scale mock ups, site visits, newsletters, task teams (user committees), simulation (electronic), scenario's (actors), town hall meetings; demonstrate how one can use the space

Key activities e.g. identify key points of resistance, stakeholders, key opinion leaders, communication program

Key issues and challenges e.g. compensation by cell phones and laptops does not work anymore (also available in traditional offices)

Case study: mistakes made (rigid planning driven procurement process)

Link to strategic business objectives: making "informed decisions"

3.2 Definitions

| | |
|-------------------------------|--|
| Benchmarking | The continuous process of identifying and implementing the best practices to achieve top performance |
| Flexible Work Scheduling | Using non-standard working times for an organization's regular employees, e.g. flextime, job sharing, compressed work weeks, part time permanent, work sharing and phased retirement |
| Flexible Staffing | Using a contingent workforce ring to supplement an organization's regular full time staff, e.g. temporary agency hires, independent contractors, internal temporary pools, temporary – fixed term, leased employees, and outsourcing |
| Integrated workplace strategy | Combination of management practices, physical settings, and technology to support a desired way of working |
| Organizational Ecology | The concept of an interdependent web of spatial, technological, cultural, demographic and work process factors |
| Cellular phones | Mobile phones? |
| Teleconferencing | Remote meeting using phones or computers (?) |
| Video conferencing | Remote meeting using computers and video screen? |
| | |

| | |
|--|--|
| Flexible Work Locations | Using non-traditional work settings and locations for an organization's regular employees, e.g. home-based telework, shared assigned offices, flexible work stations within a building, office swapping, non-territorial offices, and telework centres |
| - <i>Home-Based Telework</i> | An employee works part or full time at home during regular business hours |
| - <i>Shared Assigned Offices</i> | Two or more employees are assigned the same desk, office, or workstation |
| - <i>Flex. Work Location within a building</i> | Employees are encouraged to work in a wide variety of work locations and settings throughout the building based on their work tasks |
| - <i>Office Swapping</i> | Employees can occasionally work in a company location closer to their home than their assigned location |
| - <i>Non-territorial Offices</i> | Offices where employees do not have assigned workspaces and that usually have fewer desks/workstations/offices than users |
| - <i>Telework Centers</i> | Offices for use by employees whose residence is near the telework center |
| - <i>Hoteling</i> | A sophisticated form of a non-territorial office involving using a computerized reservation system to reserve space |
| - <i>Group Address</i> | Non-territorial offices that serve only a specific group or department; that is, the people sitting in that area are organizationally interdependent |
| - <i>Free Address</i> | Non-territorial offices that serve anyone from the company that needs to work in that location on a particular day; that is, the people sitting in an area are organizationally independent |
| - <i>Touch Down</i> | A variation within the Group Address in which a smaller workstation/desk is made available for a member of a specific group to use when they are in the office for a very short period of time |

| Office Types | |
|----------------------------------|---|
| - <i>Private Offices</i> | Hard wall offices with a door and only one occupant |
| - <i>Shared enclosed offices</i> | Hard wall offices with a door shared by 2-12 occupants |
| - <i>High-paneled cubicles</i> | Workstations where occupant cannot see over panels when seated |
| - <i>Low-paneled cubicles</i> | Workstations where occupant can see over panels when seated |
| - <i>Pods</i> | Sets of 4-6 workstations that are surrounded by high panels around the perimeter of the group |
| - <i>Team-oriented bullpen</i> | A group of 4-12 desks that has no dividers or partitions between them |

| Telework center | Work locations used by firms to accommodate staff who live near the telework center locations ¹ |
|-------------------------------|--|
| Multi company telework center | Telework center that is used by more than one company |
| Neighborhood work center | Teleworkcenter in a residential area, intended for use by people living close to them |
| Telebusiness center | Multi-tenancy office facilities located in Greenfield business parks, commercial strip malls, and residential developments |
| Telecottage | Telework center located in a rural area. Then intent is to bring the work to the workers electronically |
| Executive Suites | Small offices (1000 sq. ft. or less), that are leased to individual entrepreneurs and professionals, to small firms who desire a more extensive range of services and equipment than can be economically justified, or to individuals and small groups from large firms who need temporary office accommodation. |
| | |

3.3 Books and Reports

Probably not a complete list. Papers are not included (apart from a few papers).

2004

Becker, F. (2004), *Offices at Work*. Uncommon Workspace Strategies that Add Value and Improve Performance. San Francisco: Jossey-Bass.

Becker, N. (2004), *The benefits and costs of noise reduction*. Sage Urban Studies Abstract 32 no. 1.

2003

Becker, F., and Pearce, M.R.P. (2003), *A Balanced Real Estate and Human resource Model for Assessing the Financial Implications of Large Scale real Estate Decisions*. Ithaca: Cornell University International Workplace Studies Program, New York State College of Human Ecology.

2002

Becker, F., Sims, W., and Schoss, J. (2002), *Interaction, Identity and Collocation*. What value is a Corporate Campus? Ithaca: Cornell University International Workplace Studies Program, New York State College of Human Ecology.

¹ The primary requirement for a telework center is that the person using it live near it and be a member of a firm that has offices in other locations.

2001

Becker, F., and W. Sims (2001), *Offices That Work*. Balancing Communication, Flexibility and Cost. Ithaca: Cornell University International Workplace Studies Program, New York State College of Human Ecology.

2000

Becker, F., and Sims, W. (2000), *Managing Uncertainty*. Integrated Portfolio Strategies for Dynamic Organizations. Ithaca: Cornell University International Workplace Studies Program, New York State College of Human Ecology.

1998

Sims, W., Joroff, M., and Becker, F. (1998), *Teamspace Strategies*. Creating and Managing Environments to Support High Performance Teamwork. Atlanta GA: IDRC. Corporate Real Estate 2000®. Report no. 57.

1997

Becker, F., and Tennessen, C. (1997), *Managing Workplace Change*. An Assessment of the Steelcase Leadership Community Change Process. Ithaca: Cornell University International Workplace Studies Program, New York State College of Human Ecology.

1996

Becker, F., P. Gray, L. Markus, S. PonTell (1996), *Work Smart: New Strategies for Gaining Competitive Advantage*. Ontario CA: Center for the New West.

Sims, W., Joroff, M., and Becker, F. (1996), *Managing the Reinvented Workplace*. Atlanta GA: IDRC. Corporate Real Estate 2000®.

1995

Becker, F., and F. Steele (1995), *Workplace by Design*. Mapping the high-performance workscape. John-Bass Publishers, San Francisco.

Becker, F., and M. Joroff (1995), *Reinventing the workplace*. Atlanta GA: IDRC. Corporate Real Estate 2000®. A project of the International Development Research Council.

Becker, F., Joroff, M. and Quinn, K.L. (1995), *Tool Kit: Reinventing the workplace*. Atlanta GA: IDRC. Corporate Real Estate 2000®.

Becker, F., K.L. Quinn, and C.M. Tennessen (1995), *The Ecology of Collaborative Work*. Ithaca: Cornell University International Workplace Studies Program, New York State College of Human Ecology.

Becker, F.D., Quinn, K.L., and Callentine, L.U. (1995), *The Ecology of the Mobile Worker*. Ithaca: Cornell University International Workplace Studies Program, New York State College of Human Ecology.

Becker, F., and Tennessen, C.M. (1995), *The Hotel as Office*. Ithaca: Cornell University International Workplace Studies Program, New York State College of Human Ecology.

Becker, F.D., Tennessen, C.M., and Young, D. (1995), *Information Technology for Workplace Communication*. Ithaca: Cornell University International Workplace Studies Program, New York State College of Human Ecology.

Becker, F., and C.M. Tennessen (1995), *Social Connectivity in the Mobile Workplace*. Ithaca: Cornell University International Workplace Studies Program, New York State College of Human Ecology.

1994

Becker, F.D., K.L. Quinn, A.J. Rappoport and W.R. Sims (1994), *Implementing Innovative Workplaces*. Organizational Implications of Different Strategies. Ithaca: Cornell University.

Becker, F., and M. Joroff (1994), An English Perspective on New Workplace Strategies. *CRE 2000 Workplace Bulletin* 3.

1993

- Becker, F., Quinn, K.L., Rappaport, A.J. and Sims, W.R. (1993), *New Working Practices*. Benchmarking flexible scheduling staffing, and work location in an international context. Ithaca: Cornell University International Workplace Studies Program, NYAS College of Human Ecology.
- Becker, F., Rappaport, A.J., Quinn, K.L., and Sims, W.R. (1993), *Telework centers*. An evaluation of the North American and Japanese experience. Ithaca: Cornell University International Workplace Studies Program, NYAS College of Human Ecology.
- Becker, Quinn, Rappaport, and Sims (1993), *Facility Innovation Process. From Pilot Project to Standard Practice*. Ithaca: Cornell University International Workplace Studies Program.
- Joroff, M., Louargand, Lambert, and Becker, F. (1993), *Strategic management of the Fifth Resource: Corporate Real Estate*. Atlanta GA: IDRC. Corporate Real Estate 2000®.
- Becker, F.D. (1993), The ecology of new ways of working: Non-territorial offices. *Industrial Development Section* (February) pp 147-152.
- Becker, F. (1993), The ecology of new ways of working. *Site Selection & industrial Development*, 38, no. 1, February, 147.

1992

- Becker, F.D., Davis, B., Rappaport, A.J., and Sims, W.R. (1992), *Evolving workplace strategies*. Investigations into the ecology of new ways of working. Ithaca: Cornell University International Workplace Studies Program, NYAS College of Human Ecology.
- Becker, F.D. (1992), Managing space efficiently: Non-territorial offices and universal plan offices. *Property Management* (10) no. 3, 231-240.
- Becker, F.D. (1992), Making non-territorial offices work. *Premises and Facilities Management* (August), pp 15-16.

1991

- Becker, F., Sims, W., and Davis, B. (1991), *Managing space efficiently*. Ithaca: Cornell University International Facility Management Program. College of Human Ecology.
- Becker, F.D. (1991), Exploding the myths. *Premises and Facilities Management* (February) pp 44-47.
- Becker, F.D. (1991), Non-territorial gains. *Premises and Facilities Management* (June) pp 13-15.
- Becker, F.D., Davis, B. and Sims, W. (1991), The non-territorial office. Critical success factors. *Facilities Design and Management* (February) pp. 48-51.
- Becker, F.D., Davis, B. and Sims, W. (1991), Using the performance profile to assess shared offices. *Facility Management Journal* (May/June) pp. 14-29.

1990

- Becker, F. (1990), *The Total Workplace*. Facilities Management and the Elastic Organization. New York: Van Nostrand Reinhold.

1989

- Becker, F. (1989), Design for innovation: The total workplace concept. *Illume* (Japan) (1) 2, 60-81.

1988

- Sims, W., and Becker, F. (1988), *ORBIT 2.1, A Systematic Method for Building Appraisal*. Facility Research Assoc. & DEGW.
- Becker, F. (1988), Form follows process at dynamic Lloyds of London. *Facility Design and Management*, February, 55-58.
- Becker, F. (1988), ORBIT 2.1. *Facilities* (6) 3, 5-7.

1986

- Becker, F.D. (1986), Loosely-Coupled Settings: A Strategy for Computer-Aided Work decentralization. *Research in Organizational Behavior*, 8, 199-231.

Becker, F., and Hoogesteger, A. (1986), Employee adjustment to an office relocation. *Human Ecology Forum*(15) 4, 6-9.

1985

Becker, F.D. (1985), Loosely-coupled settings. A strategy for computer-aided work decentralization. In: Staw, B., and Cummings, L.L. (eds), *Research in Organizational Behavior*. Greenwich, Conn.: JAI Press.

1983

Becker, F.D., Froggatt, C., Gield, B. et al (1983), Office design in a community college. Effect on work and communication patterns. *Environment and Behavior* (15) 6, 699-726.

1982

The Successful Office.

1981

Becker, F.D. (1981), *Workspace*. Creating Environments in Organizations. New York: Praeger.

PM

Physical Settings and Organizational Development.
Making and Managing High Quality Workplaces.

3.4 Summaries and key findings

| |
|---|
| Becker, F. (2004), <i>Offices at Work</i> . Uncommon Workspace Strategies that Add Value and Improve Performance. San Francisco: Jossey-Bass. |
|---|

Discussion of the office, not primarily in a utilitarian way (i.e. what is the quickest and cheapest way to get all employees a desk, a chair, and a paper basket) , but as a strategic tool that influences the attitude and behavior and the performance of the employees (satisfaction, productivity, teamwork and collaboration and so on).
Based on hard data, case studies, and real world anecdotes on good and worst practices.

p. xix:: Conceptual Model of Organizational Ecology; linking design and technology, physical settings, management and change processes.

Warnings, e.g. p. xx: one size doesn't fit all; p. 113: take resistance seriously;

Part one: Principles of Workplace design

Chapter 1: The office as Invention. Send the intended message; draw on the past to reinvent the future; scan the globe; succeed on multiple levels (workspace; the organization; the whole system); avoid benchmark traps; embrace paradox, think as yin and yang.

Chapter 2: Knowledge networks. Rediscover work as a social activity; recognize the way we work; support continuous learning; balance individual and team performance; provoke activity-based planning. Discussion of the open plan, the bullpen, the office landscape, integrated furniture systems, the team oriented cluster, the future of the closed office, and the price of privacy. P. 33: Implications for practice.

Chapter 3: Co-location. Discussion of the value of a corporate campus; scheduled vs. unscheduled meetings; productivity vs. wasted time; corporate identity and commitment. P. 41: the organizational ecology perspective; p. 42: Implications for practice.

Chapter 4: The right for size. Maintain small scale in a large organization; provoke diversity. Discussion of the limits of group size. P. 57: Implications for practice.

Chapter 5: Mobility. Distinguish between mobile and virtual; recognize stages in a project; be aware that age and gender matter. Discussion of mobility's social infrastructure; honoring personal preferences; lessons from hoteling; mobile work and organizational identification. p. 75: Implications for practice.

Chapter 6: Flexibility. Discussion of sources of uncertainty; diversifying the portfolio; zero-time space strategies; positive and negative outcomes of different workplace strategies; modular office considerations; value for money; conventional vs. innovative workplace solutions; p. 106: Implications for practice.

Part two: Guidelines for Implementation.

Chapter 7: Getting started. A Plea for a Culture Audit. Discussion of aligning workspace strategy with business strategy; Knowing the customer; Simple Test and Massive Rollout; exploiting natural experiments. p. 118: questions for setting workspace strategy. P. 124: Implications for practice.

Chapter 8: Workspace planning tools. E.g. generating a readiness profile, or the Cornell Balanced Real Estate Assessment Model (COBRA). P. 142: Implications for practice.

Chapter 9: Measuring performance. Facility performance, human performance, and organizational performance. Use a variety of metrics. Measure what counts. Discussion of summative versus formative evaluations and an ecosystem assessment. P. 157: Implications for practice: make it feasible, keep it simple.

Chapter 10: Managing workspace change. Discussion of drivers of change; understanding the work process; engaging employees in the process; the sociology of change management; cascading information flow. P. 172: Why employee engagement matters. P. 174: Implications for practice.

Chapter 11: The value of uncommon sense. Discussion of understanding the full range of risks, questioning the obvious solutions, and a few rules. P. 185: Implications for practice.

Becker, F., and Pearce, M.R.P. (2003), ***A Balanced Real Estate and Human resource Model for Assessing the Financial Implications of Large Scale real Estate Decisions.*** Ithaca: Cornell University International Workplace Studies Program, New York State College of Human Ecology.

Description of the Cornell Balanced Real Estate Assessment Model (COBRA[®]), a prototype tool to support complex decisions in accommodating change, including investment and operational costs, exit costs, key human resource factors (strengthening the firm's competitive position in the market place, the firm's ability to attract and retain staff, and their ability to work productively; reduction of staff turnover), and measures of uncertainty.

The typical financial analysis was a discounted cash flow model, that calculates a life cycle value for the proposed project given assumptions about capital and operating costs and terminal residual value. These models focused only on tangible real estate costs and ignore most. But human resource considerations were identified as an important consideration, if not a major driver. The most common human resource factors considered were regional wages and the availability of a desired labor force. COBRA demonstrates how a single integrated tool can simultaneously consider both conventional real estate factors and key human resource factors, and how these might vary in an uncertain business environment.

The tool may be used for instance to count the % of productivity increase that is needed to compensate for the high cost of collocating a faculty. Or the reduce in turnover to compensate the cost of employee services. Or the outcome of increasing densities and

productivity/turnover consequences. Working with the tool includes test for sensitivity and reasonableness. One assumption is for instance that one turnover costs 50% of salary & benefits. This default value can be easily changed, e.g. as a result of debated estimates by managers. The tool uses Monte Carlo simulations that forces a more explicit discussion of risk/award profiles and allows for a sensitivity analysis to see which assumptions are the critical drivers behind the results. The Monte Carlo software used in COBRA is @RISK, a product of the Palisades Corporation. The tool also uses stochastic techniques that capture the probability of specified outcomes. By running the program many times (e.g. 1000 times in 1.5 minute) the resulting insight is much better than just a comparison between the best case, worst case, and a most likely analysis. The model is structured so that it is easy to store sets of assumptions ('Scenario's', what if) and compare different proposals.

The tool has been applied on a comparison between three campus scenario's: continue ad hoc leasing, build non-branded campus, or build branded campus.. The project life is set on 20 years. Some findings: a 1% improvement of productivity would have a discount present value of \$20 million dollars. A 1% point reduction in the turnover rate (about an 8% decline from 12% to 11%) would have a discounted present value of approximately \$13 million dollars.

Becker, F., Sims, W., and Schoss, J. (2002), ***Interaction, Identity and Collocation***. What value is a Corporate Campus? Ithaca: Cornell University International Workplace Studies Program, New York State College of Human Ecology.

Assumed benefits of a Corporate Campus

Lower cost; greater operational efficiencies; increased flexibility, agility and speed; stronger branding; identity and community; communication and collaboration; security/business continuity; enhanced attraction and attention of talent by exploiting its scale to justify providing amenities that employee 'value'.

Potential disadvantages during economic downturns and in the face of threats of terrorism and natural disaster.

Aims of the study

To test the presumed benefits and assumptions underlying collocation, with a focus on increased communication and collaboration stemming from having 'everyone under one roof'.

Research design

Web-based survey and interviews in four different companies, architecturally non-branded, ad hoc, and urban campus, vs. architecturally non-branded, ad hoc, suburban campus, and architecturally branded, purpose built, suburban campus.

Research issues

Pattern (frequency) of face-to-face interaction across organizational distance (ones own group or team, department, different department, different division) and physical distance (one's own floor, different floor but same building, different building); variety as a function of organizational factors such as job level, job function, age, experience in the company, or gender; ditto as a function of physical factors such as t the size of the building or the distance and time to travel between buildings; relationship between interaction patterns and the sense of belonging to the company.

Findings form literature

For people who uses them, campus amenities like cafeterias and fitness centers contribute to cross-departmental communication. These facilities act as a magnet for gathering people and catalyzing informal interactions and networking within and across departmental boundaries. However, these amenities are used by only a fraction of the campus population.

In a research of dozens of engineering design teams in the USA and UK over a 25-year period, Allen (1977) consistently found that face-to-face interactions declined dramatically beyond about 30 meters. Strong organizational connections extend this distance only slightly to 50 meters.

Teams working together in a collocated fashion tend to be more effective (Parker, 1994; Rosen, 1989).

According to a study of Teasley et al (2000), the productivity of software programmers in a war room was twice as high as of the team in a conventional cubicle office space.

Organizational identity (defined as shared members' beliefs about the organization's central, enduring, and distinctive characteristics) may be a critical factor holding virtual organizations together (Wiesenfeld and Raghuram, 1999).

Strength of identification affects critical employee beliefs and behaviors. However, there seems to be no significant relationship between employees' virtual status per se and their level of organizational identification.

Findings from the IWPS-research

Indeed the frequency of interaction dropped off significantly as distance increased both organizationally and physically. Over 90% of the respondents met at least once a week with someone from their own group or team. This declined to 76-79% for meetings with other people from a different department, and about 50% with meetings at least once a week with someone of another division.

More formalized scheduled meetings are often seen as inefficient and unproductive. Informal, unplanned meetings are generally viewed more positively.

Significant portions of time spent going to and from meetings can be viewed as productive.

Often people go with someone else, discussing work-related items. But if the amount of time to reach their destination is uncertain (e.g. using public transportation) travel time is perceived as wasted time.

Age, gender, and job level had no effect on sense of belonging. There was no significant relationship between interaction frequency patterns and individual's sense of belonging.

There was a positive relationship between the campus facility being seen as reflecting the corporate image/culture and employees' sense of belonging.

There is a strong effect of the quality of interior space standards and consistent footprints, furnishing and interior design.

Corporate culture and the nature of the campus influence to some extent the value employees place on meetings in different buildings, sense of belonging, and the frequency of face-to-face meetings.

In building C, the location in Manhattan, not the buildings themselves, is central to the identity of the company and to employees. In company B, the product is the image, and its everywhere. For global firms in general, while the visibility of the firm may be enhanced in the locale, brand cognition with customers rests on its products and services, advertising, and local physical presence.

The factors that receive the highest rating for taking a position within a company initially and remaining with the firm were the nature of the job and compensation, followed by the location of the campus within the USA, the people you work with, one's immediate manager, and pride working for a major company. In terms of the physical factors, most important were the location of the campus, campus amenities, and one's own office or workstation. Having a corporate campus rated much lower.

Implications for Workspace Planning

The single most important facility decision is who goes on the same floor, based on who would benefit most from being collocated.

Given the relative infrequency of face-to-face meetings beyond one's own department and own floor, the fact that most such meetings are scheduled in advance, and that most respondents indicated that e-mail was effective for communicating with different groups, departments, and divisions, it seems reasonable to conclude that, in terms of interaction, campus collocation may not be critical.

When combined with the potential for lower annual real estate costs, effective use of communications technology, and attracting and retaining employees wanting to reduce their commute, the benefits of distance are likely to outweigh the loss of very short and easy travel to occasional meetings with those outside one's own group or team.

While research has shown that fitness programs improve productivity by reducing absenteeism, raising morale and improving performance, and reducing insurance costs and medical claims, there is little evidence to suggest that cutting back these programs increases turnover.

For employees, the key main value of a campus is the provision of two amenities: fitness and dining.

p. 50: Workplace Survey

Becker, F., and W. Sims (2001), *Offices That Work*. Balancing Communication, Flexibility and Cost. Ithaca: Cornell University International Workplace Studies Program, New York State College of Human Ecology.

Based on the work of three graduate students, review of literature, and site visits in a.o. Sweden, 2000.

The Dilemma

Balance the competing goals of reducing capital and operating costs, increased flexibility and adaptability over time in the face of uncertain organizational change, while creating a workplace that helps attract and retain the highest quality staff and enables them to work to their fullest potential.

The Solution

In comparison to both high-paneled cubicles and private, enclosed offices, more open small scale team-oriented environments a) increase the flow of information that employees view as fostering better quality work and faster decisions; b) do not impede the ability to work productively, even for work requiring high levels of concentration; c) create a positive social environment that supports tacit learning and job satisfaction; d) accommodate unpredictable organizational change faster and with greater flexibility; e) allow higher densities that reduce occupancy costs.

Contents

p. 3: the office as a social setting
p. 5: most productive hours
p. 9: the open vs. closed office debate; p. 11: office type and interaction;
p. 27: age demographics
p. 30: density variations, tipping points and buzz
p. 33: density and cost
p. 44: flexibility and speed
p. 46: summary of findings
p. 47: preferences vs. effectiveness
p. 49: how diverse a portfolio?

Organizational profile variables

p. 54: organizational hierarchy; median age; entrepreneurial spirit; information flow; organizational size; workspace hierarchy (measured on a 5-point scale)

Office types

p. 62: private offices; shared enclosed offices; high-paneled cubicles; low-paneled cubicles; pods; team-oriented bullpen.

Job types

p. 62: Technology; business development; administration; research; customer support

p. 66: *density analysis* was conducted at two levels: 1) floor, and 2) group. For floor level, two measures were used: a) Building Owners management Association (BOMAS) measure of usable area (= measured from the interior side of exterior walls and surrounding walls and excludes vertical penetrations, common support areas and primary circulation), and b) IWSP measure. For the group level only the IWSP measure was used, that was developed to reflect the experiences density in a given space rather than a real estate based density measure, and thus does not include inaccessible areas (e.g. storage/server/data rooms); an area less than 1,500 USF (= usable square feet?) was defined as close space, greater than 1,500 USF as open; the IWSP measure included dedicated support space, this is defined as an area that was directly accessible from open or closed group space dedicated for the sole use of occupants of the space.

Sims, W. Joroff, M., and Becker, F. (1998), ***Teamspace Strategies***. Creating and Managing Environments to Support High Performance Teamwork. Atlanta GA: IDRC. Report No. 57. Corporate Real Estate 2000® Research Project.

Goals: 1) To identify key issues faced by corporate real estate and facility managers and others as they prepare for, plan, implement and manage high-performance, collaborative team environments; 2) to explain how leading companies are solving these issues in innovative and successful ways; 3) to describe the new roles, skills, and attitudes required.

Descriptions are based on case studies, workshops and conversations with experts, and experience gained from consulting and research.

Chapter 1: Why teams? Discussion of the main drivers (e.g. cost reduction, improvement of communication, collaboration, and learning; reduction of speed to market and cycle times) and obstacles to successful implementation of teams (e.g. lack of integrated workplace strategy, resistance to organizational transformation and cultural change). Traditional Relay-Race Model vs. Rugby Model. Reported gains: 25% reduction in cycle time and a 30% reduction in development costs (Ford Motor Company); 20% increase of productivity and delivery speed increase from three weeks to three days (GE Capital); better communication, better quality, and better morale.

Chapter 2: What is the right teamspace strategy? Discussion of the critical issues of support for teamwork; four basis strategies for flexibility (portable or mobile team settings; flexibility or adaptability; mobile employees; fixed team clusters); "harbors" and "commons". Illustrated by a number of case studies with findings 'on the positive side' and 'on the other hand' + an extensive description of the Full-Virtual Plan and the Modified-Virtual Plan of Chiat/Day.

Chapter 3: Special-Case Team Environments. 1) The traditional "executive row" office layout. Discussion of discouraging interaction; advantages of moving from traditional settings to a team-based development of a Leadership Community (Steelcase), with a variety of individual 'homes', presentation rooms, conference rooms, private alcoves ('enclaves'), kitchens or dens, and a central, technology-based interactive space (the 'Center'). The new layout resulted in a total private space reduction from 28,000 sq. ft. to 4,500 sq. ft. and a total shared space increase (from 4,030 sq. ft. to 21,000 sq. ft.), a total space use reduction of 20%, a shift from mainly tactical to mainly strategic, a shift of less scheduled meetings and more spontaneous interactions, and higher employee satisfaction. P. 93: 8 guidelines for successful implementation of executive leadership teams. 2) Discussion of Corporate Headquarters Designed for Teams and the performance of offices 'designed for efficiency' vs. 'designed for effectiveness'. 3) Large Industrial production Development Centers. 4) Team Hotels. 5) Resort Team Office. 6) Crisis Centers and War Rooms.

Chapter 4: Teamwork in Cyberspace and Place. Discussion of the latest developments in computer supported cooperative work areas; WWW and Internet; Cyberspace Work Tools to extending, enriching, and expanding the work environment; Blended Workspaces. P. 128: a list of tools (plus websites) available for work in cyberspace.

Chapter 5: Cross-team Communication. Discussion of focused circulation and communication magnets; functional inconvenience and purposeful churn as means to stimulate informal communication; displayed thinking. P. 150: nine lessons learned.

Chapter 6: Creating and Managing Team Environments. Discussion of five main areas in this complex process: 1) making the decision to transform the organization; 2) reengineering or redesigning the organizational structure, culture, management and work practice; 3) selecting, designing and implementing the appropriate integrated workspace strategy; 4) managing the change process; and 5) actively managing the ongoing process to support the teamwork and ensure that the teamwork thrives. Including tips, guidelines, and examples of best practices.

Chapter 7: Conclusions. Discussion of 11 value points such as reallocation strategies, stimulation of cross-team communication, shifting organizational cultures away from status-based space allocation; and the critical importance of cultural change.

Becker, F., and F. Steele (1995), ***Workplace by Design***. Mapping the high-performance workscape. John-Bass Publishers, San Francisco.

See also review of Juriaan van Meel in BOSS Newsletter

Themes

- Total workplace design
- Organizational ecology
- Organizational tools to promote teamwork, organizational performance and cross-discipline interaction
- No technical details about space planning, indoor air quality, proper lighting and so on.
- Few 'hard' empirical data
- Clear attention tot product and process, physical workspace, organizational culture, work processes and IT

With many examples of new ways of working in different countries; illustrations by Christopher Budd

p. xi/xii key themes ('hypotheses')
performance measures e.g. organizational health

H9: conceptual framework / comprehensive strategic view of workplace strategies and change management
Planning process and leadership roles
Concept of workplace quality

H13: summary + simple recommendations

Becker, F., and M. Joroff (1995), ***Reinventing the workplace***. Corporate Real Estate 2000. A project of the International Development Research Council.

1993: introduction of IWS = Integrated Workplace Strategy

Mapping the change process

- CRE 2000 Toolkit: a.o. tools for conducting occupancy analysis and time-activity patterns
- p. 8: forces driving change
 - p. 13: business-driven versus cost-driven
 - p. 16: development of the modern office timeline;
 - 1970: first non-territorial office (IBM); see also p. 21
 - p. 29: critical success factors
 - p. 31: getting started – key issues
 - p. 55: managing change
 - p. 63: Ten Commandments for Change (Kanter, Stein and Jick, 1992)
 - p. 69: nine points to remember about change management
 - p. 85: ongoing maintenance and management + key questions to ask
 - p. 97: assessing performance
 - p. 103: results-based versus time-based measures
 - p. 104: qualitative vs quantitative
 - p. 108 multiple measures of success
 - p. 115 Myths and Realities: ten common barriers to IWS and how to solve them

Becker, F., K.L. Quinn, and C.M. Tennessen (1995), *The Ecology of Collaborative Work*. Ithaca: Cornell University International Workplace Studies Program, New York State College of Human Ecology.

POE of Chiat/Day inc. in Los Angeles, New York City and Toronto + literature review. The study focused on a workplace strategy in which an advertising agency implemented a team-based “virtual office” (1993) to support an organizational shift from individual departments serving specific clients to strategic business units serving a specific industry (or, in some cases, a large client). A combination of project rooms, activity areas, and individual workstations. Upgrading of technology. Due to the impracticality of quantifying the issues of telework in this study, interviews and anecdotes were the primary sources of data collection.

Key findings

A greater number of employees and a large office size, in combination with multiple floors, limit interaction outside of teams and particularly outside strategic business units. Project rooms lead to better communication, and this communication resulted in better coordination and team spirit.

A common room helped reduce hierarchical interaction patterns.

Collocation of disciplines enhanced communication and collaboration.

Lack of quiet places. For concepting ideas, people went to the golf course, a restaurant, a hotel room or an employees’ apartment.

Younger employees prefer to go to the offices, because it is easier for them to learn their jobs in the office, it is a fun place to work, and because they like the energy.

There was less in-office socializing than in the old situation.

- p. 4: positive effects of team work
 - p. 4: difference between functional teams and the “relay race model” vs p. 6: cross-functional teams (“rugby model”) with simultaneous engineering and concurrent design
 - p. 10: not the frequency of communication indicates project team success or failure, but the pattern of external activities
 - p. 10: team members must propose three activities: task coordination, ambassadorship, and scouting
 - p. 11: three types of communication: to inform, to coordinate, to inspire
 - p. 12: Allen (1977)
- Communication reached its lowest point after the first 25-30 meters; researchers from different departments located on the same floor were six times more likely to work together on projects than researchers who were on different floors or in different buildings;

researchers with offices next door to each other communicated twice as much as those who were located on the same floor; p. 15: just having quality information available is not enough; unless that information is highly accessible, teams will not use it.

p. 13: Kraut et al (1990) indicate that proximity, rather than common interests, influenced the frequency of communication (which often leads to collaboration); the quality of communication (richness); and the cost of communication (walking next door versus an airplane trip); people choose the communication method that requires the lowest personal cost to themselves

p. 14: Steelcase: study (Resch, 1994) of two teams indicated that, while team communication, collaboration, and cohesiveness improved, individual productivity decreased.

p. 14: value of "interaction-promoting facilities" or "activity generating areas" (activity generators) such as wash rooms, coffee areas, copy, supply or mail rooms, or any other area shared by more than one group

p. 53: management and cultural differences

Becker, F.D., Quinn, K.L., and Callentine, L.U. (1995), *The Ecology of the Mobile Worker*. Ithaca: Cornell University International Workplace Studies Program, New York State College of Human Ecology.

Research theme

The extent to which factors such as household composition, whether one is married or single, has children, and so on, as well as the nature of the home and other alternative work environments, affect employee's response to and ability to work effectively in a mobile environment.

Case

IBM Integrated Workplace Strategy, Indiana, implemented in 1992-1993, 300 employees involved. The 'Midwest Mobility Program' allowed all employees who spent a large proportion of their time (approximately 70%) with clients to work the remainder of their time in home offices and a central office, called a Productivity Center. In addition, employees were free to work in any other 'found' workspace, including IBM drop-in sites, restaurants, hotels, airports.

Key findings

Employees worked on an average of 60 hours a week, higher than previously but possibly unrelated to mobile work per se.

The home office was used most and considered the best place for doing work requiring high concentration.

Almost 40% found non-traditional hours to be productive; employees with children were more likely to report working non-traditional hours than employees without children.

76% were somewhat or very satisfied with the mobility program; 13% reported being somewhat or very dissatisfied.

While overall satisfaction levels were high for both men and women, women were more satisfied than men.

52% reported that their overall work effectiveness was (much) better, 18% reported (much) worse.

77% reported that professional communication at work was worse, 9% rated professional communication as better.

88% rated the ability to socialize with their co-workers as worse, 3% as better.

While overall job satisfaction scores were high, employees who had been participating in the mobility program for more than twelve years had significantly lower scores for satisfaction.

47% reported job stress as (very) high, 19% as low; mobile workers with no children reported significant less stress than those with pre-school children; married or partnered couples had higher stress scores than divorced or single employees.

46% reported positive spillover between work and family life; 14% reported the effect to be negative; women reported more positive spillover than men;

Somewhat conflicting with these findings, 41% reported that the impact of the mobility program on role conflict was negative.

A general conclusion may be that employee acceptance of an integrated workplace strategy, including the opportunity to work at home, is largely unaffected by household composition or the nature of the home workplace.

Conclusion

Employees have to develop rules and protocol for how and when family members interact. Without programs to stimulate planned informal interaction and business communication, the organization loses the collective learning and connectivity that is so valuable to the long term success of the organization.

p. 65: Mobile Workplace Survey

Becker, F., and C.M. Tennessen (1995), ***Social Connectivity in the Mobile Workplace.*** Ithaca: Cornell University International Workplace Studies Program, New York State College of Human Ecology.

Case study of Digital Equipment Corporation, UK. The research examined the social ramifications of a flexible work program in which the firm addressed the social connectivity issue through a series of formal and informal policies and practices over the course of a year after implementation (1994). The large traditional office was closed and its nearly 100 employees became mobile workers, working from a Digital telecenter (unassigned workstations; no personal storage; no conference space; ratio of touch down desks to employees 10:1, after adding 30 employees 12:1), a telecenter in a Digital selling partner office, from other Digital offices anywhere in the UK, from their customer's offices, and from their cars, hotel lobbies, and even a supermarket. 13 Newmarket employees representing all job types were interviewed.

p. 1: organizational goals and ways they are being addressed

p. 3: drivers to change

p. 21: some of the principles behind flexible work programs at Digital

p. 22: expected benefits of the telework solution

p. 22: the change process (with much user involvement!)

p. 27: some of the rules from the Flexible Working Handbook) to encourage desired behavior

p. 67: The survey data suggested that morale was improving and that time was being spent better. The interview data describe staff struggling to maintain social and work-related contact. Surveys miss the small details.

Findings from literature review

In flexible work practices that involve working remotely from a central office, employees feel organizationally disconnected and socially isolated.

Productivity gains from 10-100% as a result of implementing some form of telecommuting (Alvi and McIntyre, 1993; Gordon, 1988; Manning, 1985).

Enhanced ability to attract and retain qualified workers (Alvi and McIntyre, 1993; Gordon, 1988; Huws et al, 1990) as well to recruit qualified disabled workers, homemakers, and childcare providers (Gordon, 1988; Huws et al, 1990).

Reduced employee turnover by retaining valuable employees who might otherwise leave (Becker et al, 1993; Gordon, 1988).

p. 6: Allen (1977), three types of communication: to coordinate, to inform, to stimulate creativity

p. office distance is an important factor in informal communication (Zahn, 1991; Sundstrom et al, 1990; Tjosvold (1991).

Informal communication is accounting for 85% of the interactions; about 50% were completely unplanned and shorter than others; many smaller decisions and much of the coordination during project execution were completed in briefer and more spontaneous encounters (Kraut et al, 1990).

Newcomers rely mainly on observation of others, followed by communication with supervisors and coworkers to acquire information (Ostroff and Kozlowski, 1992).

Activities and functions can be broken down into four components: 1) the activity proper; 2) a specific way of doing it; 3) additional, adjacent, or associated activities that become a part of an activity system; and 4) symbolic aspects of the activity (autonomy, technical competence, status) (Rappoport, 1970). Managers usually overlook the additional and associated activities and symbolic aspects, whereas users attend to focus on it.

Employees of a high technology firm who were working separately and communicating electronically were able to come together when necessary and were comfortable with the use of these electronic technologies as a forum for asking questions and exchanging information (Becker, Tennesen and Young, 1995); they felt that using electronic technologies such as e-mail enabled them to maintain better contact with coworkers than in the past.

In another study, workers formed significantly more lasting social ties with others in the organization (Bikson and Eveland, 1988).

The higher the proportion of their working time teleworkers spend at home, the more dissatisfied they are with their contacts with others in similar work (Huws et al, 1990).

According to De Jonge (1992) if people start to do teleworking more than 50-60% of the time, they no longer feel part of the organization.

When communicating exclusively using information technologies, such as in a full-time teleworking environment, workers may become isolated, have elevated levels of stress, and reduces morale (Martino and Wirth, 1990). Attachment to the corporate culture will be diminished (Wilkes et al, 1993).

In one of the studies all the younger (under 28) and single teleworkers dropped out of the program because of their need for the social interaction (Pratt, 1983).

Findings from the case study

Mobile workers developed a new appreciation of face-to-face contacts.

They spent less time together as mobile workers but when they were together, spent more time socializing. Unplanned interactions involved intense sharing and catching up with one another. Meetings, which once were considered an annoyance and not taken seriously, were now eagerly anticipated. Mobile phones were used more often now, and instead of having a quick phone call, people chatted for over 20 minutes.

Informal socialization (organizational learning, informal sharing and trust building, and spending time with friends) declined significantly, in part because of the formerly active sports and social club disintegrated in the flexible work environment.

Planned meetings were held in the telecenters and other Digital offices, as well as hotel lobbies and a nearby supermarket. Informal socializing occurred over pub lunches or in the supermarket cafeteria.

Cross-functional and brainstorming communications were primarily handled face-to-face and, as a result, were less common in the flexible work environment.

Communication to inform and to coordinate were more often handled using information technologies in the new environment than they had been in the past.

Virtually no social communication or non-administrative/logistic work-related communication took place using electronic mail.

In the flexible work environment, the former close-knit family atmosphere evolved into a disjointed family, but flexible working was not the cause of this change. The series of reorganizations and layoffs driven by poor financial performance was the major change factor. Mobile working just exacerbated the problem.

The telecenter support staff, as the only permanent staff, became the focal point of coordination and socialization activities.

Service employees and systems integration consultants, who had busy work schedules at client sites, seemed least concerned about the social changes in the workscape. Sales people's reactions were mixed. The technical consultants who had worked near each other in the office prior to the program were having a difficult time adjusting.

For most staff, technology had not yet become a viable substitute, or even complement, to a reduction in face-to-face contact.

Because of the use of different locations, there was a greater use of remote management, increased contact with Digital equipment selling partners, and increased contact with ex-Digital employees.

A study by another independent contractor suggested that performance, in terms of customer response, improved over time (Horack and Adler, 1995). Employees also reported using their time more effectively, including increased time spent at customers sites, one of the goals of flexible work program. So the fact that because people are unhappy with aspects of their jobs does not mean that they are not productive (p. 67)

The overall picture is of a company and its employees in transition. In the long run the effort dedicated workers must make to overcome obstacles to working effectively takes his toll, but this longer term impact was not assessed in this study.

Becker, F., and Tennesen, C.M. (1995), *The Hotel as Office*. Ithaca: Cornell University International Workplace Studies Program, New York State College of Human Ecology.

A case study of a hotel/local business alliance, i.e. Pacific Bell Directory sales team in Ontario, California, housing all its employees at the same hotel. The team upgraded the hotel's infrastructure to support the ability of the managerial, support staff, and sales representatives to work from conference rooms and individual suites.

Research themes

Costs and benefits of a new way of working (all representatives lived in the same hotel complex and, instead of working from the campaign office, were equipped to work from their individual hotel suites) compared to the traditional situation (one campaign office - an open plan with assigned desks and an enclosed office space for the managers - plus individual residential lodging, searched for by the representatives themselves), social isolation, separation of work from home life, and communication, learning, and cohesiveness among coworkers and teams who do not physically work together.

p. xii: lessons learned; p. xiii: proposal to reinvest money in design and training

p. 2: benefits of new ways of working

p. 12: expected benefits and potential drawbacks of new arrangement

p. 73 Workplace Surveys (new and traditional campaign version)

Findings from literature review

p. 3: laboratory studies show that open communication influence performance of teams;

p. 3: both individual and group decisions were best in the free discussion condition

p. 3: In a study of 100 sales teams, Gladstein (1984) found a positive relationship between team member's ratings of open intra-group communication and their ratings of job satisfaction and effectiveness but not to *actual* sales performances; group members attributed sales to group interactions, when it was market growth, experience levels, and other unidentified variables that actually determined sales revenue

p. 4: commitment has been shown to have bottom-line implications in important areas such as 'going the extra mile' (Smith, 1991)

p. 5: according to McGrath (1984) communication is related to cohesiveness; Stodgill (1972) found group cohesion to be positively related to performance in some studies, negatively related in others and unrelated in still others; Sundstrom et al (1990) concluded that the link

between performance and cohesion may depend upon group norms. Feldman (1977) demonstrated a positive relationship between feelings of acceptance and competence.

p. 7: Ostroff and Kozlowski (1992) report that newcomers rely mainly on observation of others, followed by communication with supervisors and coworkers to acquire information

p. 8: according to Huws et al (1990), in addition to requiring different methods of monitoring, remote management also needs a much more formal pattern of communication; however, teleworkers regret the resulting depersonalization of communication (Craipeau and Marot, 1984).

p. 9: Kinsman (1987) reports feelings of isolation in her study of teleworkers

p. 11: roughly 40% of teleworkers see separation of work and leisure as a problem (Huws et al, 1990)

Empirical findings from the case study

Some sales representatives felt that they worked more hours as a result of the new arrangement, due to the convenience of having the computer in the room. With the removal of the representative's workstations from the campaign office, spontaneous daily interactions among the representatives was minimized. Consequently, there was less interaction overall. Particularly for inexperienced representatives, a forum of sharing, asking questions and general camaraderie can be very important. The sales representatives met together informally during the evenings more and more over the course of the campaign. But these gatherings were an imperfect substitution for the informal discussions that went on in the office of the traditional campaign. Only certain people regularly took part in them and they occurred less regularly and spontaneously.

Individuals felt the blurring of their work and home lives in four areas: a) feelings of being unable to separate from work due to having one's office in the home; b) feelings of personal time being violated when accidentally encountering coworkers in the evenings on one's "own" time; c) feelings of having difficulty maintaining personal time because of team expectations that evenings were for socializing with work friends; and d) feelings of one's entire life happens in the same place.

People were generally happy with working out of their own suites. They liked the convenience and control over their own work, and they believed that eliminating the group office and working in one's suite resulted in greater productivity through less interruptions and greater ease of concentration. People liked the separation between the living room and office space downstairs and the bedroom upstairs better than opposed to studio-styled rooms where all activities occurred in a single area.

The representatives liked the hotel complex layout with staggered entrances of the units, because it served to limit unplanned interactions with coworkers, that is usually the case with a layout in which all units faced one another. The hotel lobby area was located just one flight of stairs below the campaign office and was the site of the complementary breakfasts and happy hour, and as such became an informal gathering place.

Some representatives were concerned about the image presented to customers of having their office located within a hotel.

Peoples reactions were more positive over time, due to an inevitable adjustment period.

The additional costs of wiring and removing equipment at the end was \$ 5,000; but the elimination of the campaign office lease and restructuring of the reimbursement system easily offset that cost. Overall savings were estimated on \$ 75,000.

Becker, F.D., Tennessen, C.M., and Young, D. (1995), *Information Technology for Workplace Communication*. Ithaca: Cornell University International Workplace Studies Program, New York State College of Human Ecology.

Research at Sun Microsystems in Silicon Valley, California, into the use of Electronic Communication Technologies (ECT's) for remote workplace communication. One question is also if certain groups such as women or older employees are less comfortable with the use of EC's. Sun Microsystems was chosen because it is at the high end of the curve in terms of commitment to and employees' experience with ECT's. Research methods were an electronic focus group an e-mail survey. Low response (396 out of 2,642 = 15%).

Findings from literature research

Face-o-face communication is the richest form because it provides instant feedback, involves the transmission of multiple cues (body language, voice tone, inflection, interpretation), uses natural language, and is directly personal. Written paper-based media are at the opposite end of the spectrum. It is better suited to bringing about attitude change.

Drawbacks of face-to-face communication are that higher status people in organizations and males tend to dominate and control ace-to-face discussions.

Groups working electronically are more likely to take riskier decisions, and produce more ideas in brainstorming tasks (???).

Computerized communication may result in greater degrees of rude and impulsive behaviors (anonymity!). A too strong and one sided focus on electronic communication may lead to social isolation, elevated levels of stress, and reduced morale. But e-mail can also increase employees' connectedness and commitment to one's employer.

Key findings from the case

No significant differences were found in use or response to ECT's as a function of age, gender, or years in the company, with one exception: employees with less than ten years of work experience were more likely to use ECT's.

Most respondents used and preferred ECT's for the majority of their everyday workplace communication. ECT's are well-suited for communications directed at large numbers of people, and those that either did not need an answer or were not time sensitive. Employees like the asynchronous aspect of electronic communication. ECT's and e-mail were a great way to get to know others with similar interests. Sharing of specific information and coordination activities are specially well handled by ECT's. E-mail is preferred for the middle stages of projects (technical and administrative communication).

Depending upon the type of feedback, face-to-face communication is more appropriate: for complex discussions, personal or sensitive issues, and problem-solution tasks. Face-to-face communication is especially preferred (e-mail disliked) for team building and brainstorming. Although ECT's were used for the majority of communications, they do not replace face-to-face contact. When people meet face-to-face, these meetings were more focused as a result of having communicated electronically.

The majority of the respondents did not feel that their use of ECT's had any effect on the amount of face-to-face contact they had (???). Rather than reducing or eliminating face-to-face contacts, many employees use ECT's in conjunction with face-to-face communication, that enabled them to maintain better contact with more people

A growing problem is message overload. This results in long delays before getting response if a response is received at all. Therefore, many preferred a face-to-face meeting, when their communication is urgent.

p. 45: Workplace Survey

Overall conclusion

When electronic communication tools are provided and become part of the basic organizational culture, they can be used effectively to support work-related and social communication. It does not substitute for or reduce the need for face-to-face contacts.

Becker, F., K.L. Quinn, A.J. Rappaport and W.R. Sims (1994), ***Implementing Innovative Workplaces***. Organizational Implications of Different Strategies. Ithaca: Cornell University International Workplace Studies Program. **Full length report** (including questionnaires, interview protocols and references) + **Summary Report**.

Study in 5 international organizations in 4 different countries: IBM and Ernst & Young in the UK, Digital Equipment's Natural Office in Sweden, SOL Cleaning Company headquarters in Finland, and the Shimizu Institute of Technology in Japan.

Goal of the study

To better understand how the implementation strategies of different workplace innovations affect user satisfaction, work effectiveness (measured by user satisfaction on a 5-point scale: concentration, amount of work, quality of work, access to files and references + average index)), duration and acceptance, cost to implement the project, and organizational learning; Investigate how different approaches or strategies change over time as the concept moves from a small scale implementation to a corporate-wide program.

Understanding what factors (i.e. planning and design process, nature of technology, the design of the setting) tended to change the most as the project evolved.

Understanding what differences existed as a function of whether the workplace system was primarily cost-driven versus business-driven, solution-oriented versus process-oriented, part of a strategic versus independent initiative.

Definitions of all concepts.

Findings

The nature of the planning process had the most influence over user response, more than technology and design.

Business-oriented strategies often look at the projects as means of reengineering the organization and are more innovative.

In business-driven projects 88% of the respondents rated their satisfaction as (very) satisfied, compared with 40% of respondents in the cost-driven projects.

Cost savings went up to 50% in space requirements.

In business-driven projects a large amount of the cost savings are re-invested into other functional areas, with a positive effect on user satisfaction and self-reported productivity.

Cost-driven projects appeared to shift the costs from the initial outlay to the ongoing operation of the project ('pay now or pay later').

Solution-oriented projects were generally less expensive to implement.

In the solution-oriented projects 35% of all respondents rated their satisfaction with the new office system as (much) worse, and 42% as (much) better; for process-oriented projects, 93% of all users were rating their satisfaction with the new office system as (much) better.

There were no strong differences between strategic versus independent initiatives.

Where phases were omitted from the process, user satisfaction generally declined.

Storage, personalization, and privacy were 'perceived barriers' but these issues are very low on users' list of priorities.

Few companies had implemented an integrated workplace strategy, i.e. in which users have access to a wide array of settings both inside and outside the office.

A strong champion with a vision and user involvement are critical to the success of a project.

Using a pilot project as a laboratory from which a standard solution can be developed was associated with significantly lower levels of employee satisfaction and productivity.

p. 309: Appendix D: Cornell Workplace Survey

p. 319: Appendix E: Cornell Interview and Focus Group Questions

Becker, F., Quinn, K.L., Rappaport, A.J. and Sims, W.R. (1993), *New Working Practices*. Benchmarking flexible scheduling staffing, and work location in an international context. Ithaca: Cornell University International Workplace Studies Program, NYAS College of Human Ecology.

A benchmark study of the 16 international organizations participating in IWSP, supplemented by an extensive literature review. One of the studies in *Workscape 21: The ecology of New Ways of Working*.

Based on telephone interviews, written reports of the organizations, and written summaries prepared for the purpose of this study. No official statistics, merely estimations based on personal experience.

Themes: a) flexible work scheduling (flextime, job sharing, part-time etc.); b) flexible staffing, and c) flexible work locations.

Main *drivers* to implement

- a) Flexible work scheduling: to accommodate employees needs (e.g. for child care, personal appointments and errands; to attract and retain staff who are unwilling or unable to work on the conventional scheduling pattern; to improve employee quality of life; to meet increasingly stringent governmental regulations to reduce peak travel loads and the associated congestion and air pollution.
- b) Flexible staffing: competition and economic factors that require organizations to downsize, reorganize, and reduce headcount and to increase the organization's flexibility with respect to workload demands.
- c) Flexible work locations: reducing transportation problems or to comply with the Clean Air Act in the USA; including the size of the labor pools by including people that would otherwise not be able to work (e.g. handicapped people, families with child-care considerations); reducing employee stress from commuting; balancing work and home life; increasing employee productivity; reducing space costs.

p. 31: benefits and barriers to flexible scheduling

p. 45/46: benefits and barriers to flexible staffing

p. 51: shared assigned offices at Ernst & Young; flexfactor about 0.65

p. 58: example of office swapping (satellite office)

p. 68: positive effects of telework on satisfaction and productivity

p. 72: non-territorial offices at Arthur Anderson with 135 offices originally housing 220 managers and since then 300 managers

p. 75: IBM SMART offices; workers who spend over 70% of their time out of the office are classified as mobile. In London over 1,000 employees are being housed in a building that would normally only accommodate 600.

p. 76: Tokyo (1987): non-territorial office with more desks than people

p. 78: characteristics of 8 non-territorial offices

p. 83: benefits and barriers to flexible work locations !

Main findings

a) Flexible work scheduling is increasing worldwide.

Job sharing and compressed workweeks represent a very small proportion of the workforce. Governmental intervention (laws on the length of the work day and scheduling of hours) has a definite impact on the use of flexible scheduling alternatives.

b) The use of flexible staffing is increasing at a much smaller rate than flexible scheduling. Some organizations do not like the lack of control in the hiring process for temporary workers.

Security issues, such as access to the building and access to information, must be addressed to account for employees that are working in the organization, but are actually working for an outside agency.

c) Shared assigned offices have appeared more often in the UK and Europe than in the USA and Japan. They are not well-liked.

Office swapping (satellite offices) is very uncommon.

Work environments with a strong residential feel to them were only found in Scandinavia.

Non-territorial offices were the most prevalent form of flexible work locations.

User jobs vary across the organizations, but with the common characteristic of requiring the individual to be out of the office 50-70% of the time.

As the pressures increase for organizations to reduce costs, acceptability of non-territorial offices also increases.

The role of national culture is uncertain, but the role of cost and of management commitment is central to whether or not non-territorial offices are adopted.

Telework is increasing with the exception of Japan.

In 1993 none of the sponsor organizations were using telework centers.

North American examples of telework centers have been driven almost exclusively by government concern for reducing traffic congestion and air pollution.

The Japanese examples have been implemented by individual companies, who see these offices as a kind of physical advertisement and a showplace for the latest telecommunications technology.

Home-based telework has been viewed as appropriate for a subset of workers with particular characteristics: highly motivated, independent, at higher levels of the organization; the Dutch government experience suggests that a wider range of staff may benefit from this type of arrangement.

Facility and facility management implications

Services such as security and heating must be provided outside of the core working hours.

Permanent ownership of space may become under question as a result of increased employee participation in flexible scheduling programs.

The workplace now goes beyond the boundaries of the office. Facility managers may become responsible for many sites. They have to develop new information systems solutions, methods of servicing equipment and furniture, and purchasing methods to incorporate special needs/demands of these additional sites.

While the overall amount of space required is likely to continue to shrink, both the number of sites managed and their diversity is likely to increase.

Flexible workplace practices, to be successful, require the expertise and participation of many corporate functions. To achieve the collaboration needed to integrate the concerns and expertise of these different disciplines, new alliances will need to be formed that cut across discipline and departmental boundaries.

Organizations must examine the full range of outcomes that will enable them to better meet their fundamental business objectives.

The relationship between standard practice and customized provision need to be considered.

Flexible working arrangements tend to be informal the extent and nature of these practices.

As a consequence, organizations are making decisions about how they allocate their scarce resources of people, time, and money in an information vacuum.

Many of the traditional space management policies do not position companies to fully benefit of the fluctuating/reduced staff levels.

p. 109: EC Directives on Work Times

p. 113: Clean Air Act Amendments of 1990

p. 117: Regulation XV

p. 139: Key questions of the Telework Center Survey

Becker, F., Rappaport, A.J., Quinn, K.L., and Sims, W.R. (1993), *Telework centers*. An evaluation of the North American and Japanese experience. Ithaca: Cornell University International Workplace Studies Program, NYAS College of Human Ecology.

Driving forces behind the introduction of telework centers

To change travel patterns and help employees balance work and family life (improving 'quality of life' by reducing employees stress related to commuting)); traffic and air issues (reducing traffic congestion, especially at peak travel periods; reducing the length of commutes and therefore the amount of air pollution and energy consumption generated); to demonstrate new products ('marketing'); to model new work patterns; better way of working; promoting economic development in rural areas by bringing work to people in remote, rural areas; cost reduction; disaster recovery (decentralization, as an effect of 9/11). Driving forces differ per location.

Purpose of the study

Identify as many telework center sites as possible in North America and Japan; develop a typology; describe key characteristics; describe the effects of telework centers on workers, coworkers, and supervisors, particularly with respect to communication, work groups, performance, supervision, travel/environment, and type of work done in various locations; identify if there are different effects between single and multiple company centers, and whether the users are full-time or part-time working in the telecenter; identify critical success factors; examine the cost and space implications; examine the technology implications; identify factors that block the development of telework centers as a component of new ways of working.

Data collection

Distribution of a questionnaire, interviews and analysis of archival data.

Findings

Telework centers have been supply driven. The telework centers are driven by social and economic forces and then employees are asked to volunteer to work there.

In none of the cases that have been studied had the primary driving force been a corporate mandate to explore new ways of working, out of which telework centers emerged as one among many possible alternative work patterns.

The absence of this demand driven model may be one reason that telework centers to date (1993) have been only marginally successful institutionally.

The number of people involved in the projects has been very small.

The office ranged in size from under 2,000 ft to a little more than 8,000 s.f., with the typical office being about 2,000 s.f.

The space costs were generally subsidized through government grants and private sector donations.

Japanese telework centers tended to have more sophisticated telecommunications equipment, including videoconferencing, videophones, large format fax machines, and high speed data transmission units.

Most of the centers had a full time administrator.

Almost all users were professional staff as opposed to managers or supervisors, and the job functions were those that allowed a high degree of autonomy.

Users generally scheduled for the entire day at either the central office or the telework center, rather than working in both locations in a single day.

Employees working in telework centers are very positive about their experiences with them; telework centers enhance their productivity. The improvement in self-reported productivity was consistent across culture, the nature of tenancy, type of work, and telework center location.

While individual productivity increased for telework centers, productivity may have suffered somewhat for colleagues and coworkers who remained in the central office. In addition, work practices such as informal work-related interaction and team support seemed to have been more difficult to maintain as a result of key employees working remotely.

There was a greater sense of social isolation and difficulty in self-management among the Japanese workers than those in North America, in spite of information technology. So technology should be viewed as an "enabler" rather than an "inducer". Despite the much higher level. Both workers in multi- and single- company sites reported high levels of satisfaction and enhanced individual productivity. Observations and interviews suggested that in the North American single-company site with their high social densities there was a greater sense of being connected to the company as a whole, and less concern about being out of touch with the central office.

For any type of remote working to be successful requires new management attitudes and skills. Traditional supervisory patterns based on the ability of supervisors to visually see their staff have little value in the context of telework. Telework requires clear performance objectives.

In no instances did either managers or staff mention concerns about the security of information.

Most telework users occasionally return to the central office, often 2-3 times a week. Much more attention should be paid to the design and use patterns of telework center users when they return to the central office.

On average, in the North American telework centers there was an 86% savings in commuting time, or about 76 minutes per day each way. Japanese telework center users saved about 25 minutes per day each way.

Telework centers reduce stress related with long and difficult commutes.

In California, where automobile traffic is measured in cold starts, telework centers have not helped the environmental problem; in one of the centers 97% of users drove to the office alone.

Savings could be reinvested into new technology, more training etc.

Telework centers may challenge current zoning practices and laws that have as their basic working assumptions the desire to physically separate work and residential activity patterns. One positive implication of neighborhood telework centers may be keeping adults in the community throughout the workday, to reduce crime and vandalism.

Reflection

The question remains why, if telework centers work so well for staff and their managers, neither the number of companies nor the use patterns of individuals within them, has been high [1993, TvdV]. The answer is probably the failure to conceptualize telework centers from their inception as a new form of work which has the potential to combine cost savings with more productive and effective workers. Telework centers have been primarily viewed as a solution to problems associated with traffic congestion and air pollution, or as a way to demonstrate the value of new telecommunication technologies. In themselves, these goals are unlikely to generate enthusiasm or commitment on the part of senior managers and executives. In many cases telework centers have retained their assigned office workstations in the central office, resulting in increased organizational costs for both space and technology. In no cases have home-based telecommuting, telework centers and the central office been developed as a single, integrated workplace strategy.

Becker, F., Sims, W., and Davis, B. (1991), ***Managing space efficiently***. Ithaca: Cornell University International Facility Management Program. College of Human Ecology.

Autumn of 1989: start of the Cornell University International FM Research Program (later on: IWSP), that was intended to respond to five factors that were transforming facilities in a major management issue: the increasing cost of space; rising space requirements; changing employee expectations; dynamic organizations; and new information technologies.

Three specific studies: 1) Seven Shared Office Case Studies; 2) Two Universal Footprint Case Studies; 3) Four Approaches to Portfolio Management Case Studies. The effects of these various different types of innovation were assessed in the context of multiple performance indicators that together create a performance profile.

Key findings and lessons learned

- 1) *Shared Office Studies*. Space allocation practices involving no individually assigned desks have proven successful from a financial, employee satisfaction, and productivity viewpoint. Most successful were approaches that were productivity-driven rather than cost-driven, and that were designed from the ground up as an integrated system that considered information technology, management, and policy needs as much as physical design and layout. Employees rated their performance in most cases as being about the same or slightly better than when they had personally assigned offices. When combined with substantial space savings, these data suggest that shared offices can be highly cost-effective.
- 2) *Universal Footprint Studies*. Reducing the number of workstations or office sizes to three or fewer was effective in reducing the costs and disruption of churn while maintaining generally high levels of employee satisfaction. A critical success factor is that the same size footprint be capable and used to housed different furniture and equipment components, depending of specific job functions and workstyles.
- 3) *Approaches to Portfolio Management Studies*. The key difference in recent approaches to portfolio management is the adoption of a developer perspective in the production of corporate facilities, and the making of facilities decisions based on a business case. This includes justification of facility expenditures in terms of the occupying unit's ability to pay; and corporate services' implementation of a strong customer service orientation. Corporate-wide space standards were being replaced by guidelines and negotiated standards tailored to individual situations. Comprehensive and easy accessible databases are critical to the success of these approaches, as is a commitment to assessing consumer satisfaction and meeting consumer-defined requirements.

p. 117: Non-Territorial Office Survey

p. 125: Universal Plan Survey

Becker, F. (1990), ***The Total Workplace***. Facilities Management and the Elastic Organization. New York: Van Nostrand Reinhold.

Part 1: The changing role of Facility Management

Part 2: Organizing the FM process.

Part 3: Planning and Managing Workspace.

Part 4: Assessing Performance.

p. X: Elasticity is an attitude as much as a set of techniques, structures, policies and procedures. The elastic organization has the capacity to balance and harness the needs of the individual, the group, and the organization as a whole.

p. 6/7: Definitions of FM

Facility Management encompasses all activities in planning, designing and managing complex facilities such as offices and hospitals. It differs from architecture and interior design, where

FM refers to buildings in use, to the planning, design, and management of occupied buildings and their associated building systems, equipment, and furniture to enable and to enhance the organization's ability to meet its business or programmatic objectives. FM thus refers to organizational effectiveness.

p. 8: 5 drivers for FM: information technology, global competition; high cost of space; rising employee expectations; the cost of mistakes.

p. 14: role and task of FM

p. 26: benchmarking

p. 28: important questions to be answered by FM

p. 33: FM as a change agent

p. 38: concept of fit

p. 39: ORBIT-2 matrix routine/non-routine and low/high change

p. 49: staffing FM organization

p. 73: types of strategies

p. 76: stakeholders

p. 86: centralization vs. decentralization; choosing what to (de)centralize

p. 99: organizing the project (norms and culture; role management; role conflicts; communication strategies; tracking the project)

p. 123: Managing the briefing process;

p. 125: user participation in the development phase, not too much in the implementation phase; p. 126: decision matrix; p. 140: data collection techniques

p. 153: managing environmental change

Part 3: Planning and Managing Workspace

p. 175 Definitions of Quality

p. 168: quality and diversity

p. 195: Managing Space

p. 201: space guidelines, not standards!

Variation as a result of open/enclosed and formal/informal

p. 201: non-territorial office or free-address system (see Allen, 1977!)

p. 204: second measurement of satisfaction more positive

p. 212: standard footprints and fixed layout structure

p. 235: The Total Workplace concept: 1) the idea of integrating decisions often considered in isolation by different departments (HRM, IT, design and construction, and buildings operations and management); 2) the idea that the workplace is more than one's own personal office or workstation, it is the entire workplace (site, amenities, common areas, project rooms, support areas), a "series of loosely coupled settings"; 3) the idea that the processes used for planning, designing, and managing the workplace are as much a part of the building's quality as are its physical characteristics.

p. 236: the relay model vs. the rugby model (Steelcase Inc. 1989)

p. 241: being efficient is not always the same as being effective

p. 245; organizational concepts of Steelcase, e.g. multiple areas; neighborhoods with different disciplines; directors' clusters; activity generators; corner commons; escalators/stairs that increase visual contacts; adjacencies; security zones.

p. 261: Chapter 13, Assessing Building Performance

p. 267: indicators of building performance

p. 267: POE's

p. 279: 14 key issues; ORBIT study

p. 291: Assessing FM Performance

p. 299: feasibility; historical performance; resource allocation; priorities; reporting intervals

Each chapter ends with: *Skeptics Speak*

Becker, F.D. (1981), *Workspace*. Creating Environments in Organizations. New York: Praeger.

Focus on an organizational-development perspective i.e. the nature of the processes through which physical settings are created in organizations. Who makes what kind of decisions regarding environmental form and use, on what basis, and for what (and whose) ends?

p. 6: Environment-Space Management Responsibilities, short term and long term, affecting decisions and behavior.

Chapter 1: Human/environment relations in perspective.

p. 9: Environment as support: first-order effects.

p. 10: Environment as catalyst: second-order effects.

p. 11; Conceptual model. Environmental factors such as noise, lighting, size, arrangement, density etc. affect fatigue (direct support) and social interaction and communication (quality/level) (catalyst). Both are in the end affecting organizational effectiveness: work quality and quantity, turnover, personnel, absenteeism etc. , partly direct, partly via autonomy – build trust – provide feedback – increase motivation – generate ideas – provide feedback and so on.

Chapter 2: The physical setting as social process.

Attention (Hawthorne); formal vs. informal environmental change effort; visual order and social control; time/use patterns; environmental determinism.

Chapter 3: Information transformations.

Ambiguity by five transformations; the Environment-Docility Hypothesis (Nahemow and Lawton, 1976); flexibility; job characteristics and environmental compensation.

Chapter 4: The scientific-management legacy.

Frederick Taylor (1911); Brookes and Kaplan (1972); human engineering; control.

Chapter 5: Rethinking productivity.

Soft and hard data; satisfaction, productivity, and effectiveness.

p. 88: Conceptual model: Physical setting affects a) fatigue, comfort, safety -> performance -> organizational effectiveness; and b) autonomy, feedback, significance, information access -> satisfaction -> absenteeism and turnover -> organizational effectiveness.

Chapter 6: behavior in its physical context.

Expectations; resources; (nonverbal) communication; small-group ecology: participation; motivation/involvement/supervision; individual differences; density; ecological research; p. 103: Conceptual model: a multidimensional framework for relating individual expectations and activities to environmental-change efforts.

Chapter 7: Space policy and standards

The role of standards; OSHA regulations; different types of standards; functions of standards; centralization vs. decentralization;

Chapter 8: Planning ecosystems.

(Wrong) assumptions e.g. programming and design are discrete activities; systematic behavioral programming takes too much time and costs too much money and is not cost effective because of employee turnover.; people always resist change.

Chapter 9: Mixed blessings: the office as a home.

Office of the future.

p. 183: Conceptual model: Ecosystem Framework.

3.5 Questions for reflection

Italics = answers from Franklin Becker

Terminology and definitions

- What is the difference between a team oriented bullpen and a pod? Just the number of accommodated people, or also a difference in the edges (high panels)?
- What is the difference between a desk and a workstation?
- "Out of the office" is literally out of the building or just "away of one's desk"?
- What does workspace mean?
- How is the size of a typical footprint (42 sq. ft.) measured? Ditto of an office building (e.g. 20,000 sq. ft.), an office (100 sq. ft.), a workspace (64 sq. ft.) or a desk (18.5 sq. ft.)? Is this gross floor space, net floor space, usable floor space, or lettable floor space? BOMAS measure or IWSP measure (see p. 66 Offices That Work)?

Bullpen: 8-12 people, visually oriented to each other. Pod: smaller number of people, not team-oriented.

Desk = bureau. Workstation is a desk including other facilities, within a paneled office.

Out of office: e.g. salesmen and consultants, really out of the building. Not clearly used.

Scope: no single elements but all elements together (e.g. a landscape vs. a tree).

Floor area of a workstation: the footprint. Floor area of a total building: it should be the usable floor space, but often not clear. In a study focusing on these technical items, definitions and measurement methods should be more precise and different measurements of density should be included

For more precise definitions see paragraph 3.2.

Methodological issues

- What is your experience with web-based surveys (particularly with reference to general applicability and user's response)? Ditto with telephone interviews?
- How are effects measured on organizational performance, communication (quantity and quality), employee productivity? Interviews give mainly opinions, perceptions, personal experiences? What about "hard" data?
- How are the interrelated effects of a huge number of variables disentangled?
- Why are your 5-point scales from 5 - 1 instead of 1 - 5?
- Is it really true that it takes approximately 20 minutes to complete the survey questionnaire?
- What is your 'underlying' conceptual model?

Handing out of surveys is often practicably impossible, because most research sites are far away and corporations don't spend a minute in this. Disadvantage of web-based surveys: low response (20-25%, sometimes even lower), but low response is also due to 'tired of surveys'. That's why Becker et al always try to have large samples. Advantages of web-based surveys:

- *Managed by the Survey Research Center of Cornell, so anonymity is guaranteed (very severe legislation in the USA on privacy and confidentiality)*
- *No need to take a sample; because of use of corporate mailing lists, all employees are send an e-mail.*
- *Fast and reliable data entry.*

Telephonic interviews are used as less as possible.

Measurement includes always triangulation. All methods have benefits and drawbacks. It's important to look 'behind the data', e.g. a 5 on a 5-point scale in an enclosed office has a different meaning than a 5 in an open office. Interviews give more details and understanding. Disentangling the effects of a huge number of variables is almost impossible, but data can improve our knowledge "beyond reasonable doubt".

Adding timelines with all kind of changes (staff, organizational, physical, external such as labor market or economy) can improve our understanding of interdependency, micro and macro. See also Becker (2004) on 'Concept Mapping' to get insight in the 'big lines'. Change is a component of a complex system, that's why Becker et al use terms such as 'organizational ecology', 'workscape', the 'total workplace' and 'integrated workplace strategy'.

Often direct effects of single elements are less important, e.g. of light or color. It is the whole picture that matters. Gary Evans talks about 'cumulative risks'. One single element may have a minor effect, but a number of elements together can make a big difference.

Corporations are not really interested in performance, else they would measure it. They just want data to justify their decisions, to support decisions that are already made, never in advance. People change rapidly, and newcomers have new views, in which they believe. Companies focus on product development, testing and marketing. They are cost oriented and numbers oriented, not research oriented. Research can be important to change mindsets.

Practical issues

- What are your experiences and what are the lessons learned from working with a consortium of sponsors?
- Did you ever have problems with confidentiality (most case studies are published with the names of the firms included!)?
- How do you manage to do research all over the world, including Japan? Do you make site visits and short stays?

*It becomes more and more difficult to find organizations that are willing to be the site of a research (for fear of negative publicity and because of declining economy) and to find sponsors (corporations are sending people that are lower in the organization, on an operating level, with less views and a one sided focus on cost reduction; meetings become boring, so also interesting people get out. Now there are only a couple of sponsors left. Public organizations are not interested either. The General Service Administration (GSA), particularly the *Innovative Workplace Division*, is interested, but usually USA government is less involved in social responsibility than the Dutch Governmental Building Agency or the GSA in Canada.*

Frank let it happen and wants to start from scratch, in the field of health care. There a more academic attitude and willingness to measure is much more common.

Becker gives organizations a choice in whether a case will be published with or without the companies name (then a fictitious name).

If research sites are far away, the research team usually visits the sites several times for short periods of 2-3 days, with long days of interviews and so on.

Open questions left from research findings

- The more open, the more interruptions, but also the briefer. What is known about the effect of short interruptions on people getting out of their "flow"?
- What is known about the actual use of flexible and freestanding furniture (movable panels, desks, tables)?
- What is the present situation with respect to the impact of Governmental Legislation (e.g. its intended reduction of traffic congestion and air pollution) of flexible office scheduling on new ways of working?
- What were the long term effects of the new work strategies at Chiat/Day, the Digital Equipment Corporation, and other cases?

There is only one publication about flow (DeMarco). But there is a lot of misunderstanding. Distraction varies per discipline. Computer workers are used to many brief interruptions. For loud speaking salesmen, making a number of phone calls, an open setting is worse. Brief interruptions can lead to distraction and loss of productivity, but it can improve the

productivity of the one who interrupts (fast problem solving, preventing that one is productive in the wrong way), so what matters is not individual productivity but team productivity. In an open environment one can much better anticipate if a person does not want to be disturbed, e.g. by looking at his body language, or looking at the computer screen. In closed offices there is also interruption. We don't live in a perfect world.

Implications of research: application and implementation

- How should we transform research findings (often descriptive) into practical tools and guidelines (rather prescriptive) for policy makers, managers and other decision makers?
- What is the present use of the COBRA-tool and what are user's and researcher's experiences with the tool?
- How can we transform qualitative findings into quantitative data and guidelines?
- What do you think of the idea of a cross-case analysis and summarizing the research findings in costs and benefits of different new workplace strategies from the perspective of organizational goals and needs and employees perceptions and preferences?
- Would do you think of an Executive Summary of Frequently Asked Questions (and Answers!)?

According to Becker, companies are not really interested in research and even not in tools. COBRA is a tool that works fast and gives a clear understanding of the implications of assumptions, estimates and real estate decisions. But companies don't like the tool, maybe because they are suspicious and expect to have to pay for it, as is usual with consultants. An interesting research project would be to join a company, to offer the COBRA-tool free of charge, supported by an expert, and to investigate what is going to happen, if the tool is used, how, by whom, when, and what lessons can be learned from that.

Summarizing research data in a form of Frequently Asked Questions might be excellent.

Future research agenda

Your IWSP program is running now for more than 15 years.

- What are your present and future research questions?
- Do you distinguish between long running themes and projects limited in time?
- Ditto between fundamental and applied research?
- What do you think of the following research items? What would be your priorities?
 - The relationship between standard practice and customized provision of workplaces.
 - Quantification of space allocation strategies, e.g. guidelines for the required number of workplaces per type of workplace, linked to organizational characteristics and type of work process.
 - Monitoring the effects of new ways of working over time (longitudinal study).
 - Additional research into the effects of physical environment on team and collaborative work, creative thinking and problem solving.
 - Effects on health and safety.
 - Additional benchmarking research including countries such as Germany, France, Italy and Spain.
 - Impact of demographic variables (gender, age, ethnicity), time of involvement in the company, function and so on.
 - Further development of performance indicators and how to measure them in a valid and reliable way.
 - Building up of a global databank of offices (best practices and worst cases).

Special interests of Becker:

What is really going on within organizations? Which decisions are made, when, by whom, why. Which data are used for what?

Performance profiles, for a better understanding of performance and for reasons of benchmarking.

The 'ecology of concentration': what does really matter? Young people never work more than 40 minutes without doing something else, so what about 'flow'? What is the effect of scale, rules and norms, and so on?

Long term effects of new working strategies.

Effects of demographics, particularly age, because soon a huge number of American people will retire. One important question is: how do we attract young people to start working for the Government?!

Future co-operation

Would it be worth to continue exchange of ideas, research findings and tools for evaluation and decision support?

Becker's interests focus on co-operation in finding funding, and in information about interesting and innovative health care facilities.

Miscellaneous

Why don't you work yourself in a team oriented bullpen?

4. Facility Planning, Programming and Management

Interviews with William (Bill) R. Sims and Lorraine Maxwell, October 2004.

College of Human Ecology, Department of Design & Environmental Analysis (DEA)
E214 Martha Van Renselaar Hall, Ithaca, NY 14853-4401
Bill Sims T: Work (607) 255-1954; Home: (607) 533-7024; W: wrs4@cornell.edu
735 Ridge Rd, Lansing, NY, 14882;

Questions

What do you think about the relationship between programming and designing?
Ditto about the translation of research findings in programming and design guidelines, qualitatively and quantitatively?
Could you tell a bit more about the Computer Aided Facility Management system (CAFM)
Which are your experiences with REN and STM?
What is your experience with m2 and cost indicators (reliability, availability)?
Is it possible to see one of the student team's products of a) Programming Methods in Design, and b) The Facility Planning and Management Studio?
What in general is the response of the 'clients'?
Who will take care for workplace strategies research when you are retired and Frank moves into hospital facilities? Will there be a follow-up?

References

What is or are your favorite references on programming? Would it be possible to borrow:
Duerk (93), Architectural Programming; Pena (01), Problem Seeking; Sims & Becker, Planning and Programming Process, in: Facilities Engineering and Management Handbook; Sims (2002), Teamspace (unpublished); Becker and Sims (90), The Total Workplace; Sims and Becker (88), ORBIT-2; Sims, Converting research data into design criteria, EDRA 10.

Discussion

In the USA, too, there is a growing interaction between programming and design (Rugby Model vs. Relay Model). Different phases in programming They often work in a team of the client, a programming consultant, a construction's consultant (e.g. a representative of a constructor), etc.
Duerk, Pena and AIA (American Institute of Architects) give guidelines for structuring the brief. User participation varies much, dependent of the project. An interesting project is the one of Stephen Car (?) on "Streets for People". "Paid user consultants" were asked to make photos of liked and disliked elements in down town, discussing the results, etc. The process was extremely time consuming (professionals had to work seven evenings a week, 12 weeks long) and costly.

Classes

Most students first do the class on Programming Methods, then the Facility Planning and Management Studio (second semester, BSc 3), then an internship at a firm in practice. For re-allocation of a firm they can choose from about 40 buildings, rent, lease, or purchase. They use STM and REN (adapted to the USA, e.g. with respect to acceptable distances) and select about 10 items each. They work for "real" clients, and write a report in different phases:

a. Getting familiar with the company; b. Building Fit Analysis (focus on 5-7 items) of the building as a whole and per unit, including scenario's about growth and decline; c. Programming including a space plan; d. Financial analysis (including details and taking into account tax laws etc.).

They are looking for replacement of Bill; priority 1 is the right person, priority 2 is the theme.

Student's reports

Phase 1: FM Organization and Project Management Process, with recommendations for the structure of the FM Organization at the firm to be analyzed, the Project Management Process, the Space Allocation Policy and Process, and the Facility Maintenance Policy and Process.

Phase 2: Space Forecast and Relocation recommendation, including a Building Fit Analysis, Adjacency Analysis, Space Projection, and other considerations.

Phase 3: Site and Building Selection, including an evaluation of a number of potential sites, with criteria such as cost comparison; stacking plan; building efficiency; size and suitability of site; site characteristics; building suitability.

Phase 4: Space Planning, Design and Move-In, including site selection, space planning program, space plans and evaluation, interior design program, design alternatives and evaluation, furniture selection and cost estimate, moving plan and recommendation.

Example of Serviceability Tools & Methods: Meeting and Conference Rooms; Group Layout and Territory; Disruption to Physical Change; Distraction and Disturbance; Interior Zones of Security; Indoor Air Quality.

Time investment: formally 4/15 semester (in NL: about 80 hours), along a whole semester; working in teams of four students. In practice time investment is more.

Summary of the Lecture of Lorraine Maxwell

According to Lorraine Maxwell, POE's are primarily executed by academics and governmental organizations (because of repetition of similar buildings such as post offices). According to Preiser the costs of a training workshop are about \$ 7.500, an indicative POE \$ 8.000, an investigative POE \$ 1 á \$ 2,50 per square feet, and a diagnostic POE \$ 2,50 per sq. Ft. or more. Differences between social science en design evaluation are:

| | |
|------------------------------|-----------------------|
| Social Science | Design Evaluation |
| Control extraneous variables | describe variables |
| Causes for behavior | influence on behavior |
| Causal statistics | correlation models |
| Reduce number of variables | needs complexity |
| References | |

All required references are either required to buy or scanned and put on the website or blackboard.

Duerk, D.P. (1993), ***Architectural Programming***. Information Management for Design. New York: John Wiley & Sons. ISBN 0-471-28468-8.
Foreword by Michael Brill.

Based on the ideas of Henry Sanoff, Willie Pena, John Zeisel, Wolfgang Preiser, Jay Farbstein, Sandra Howell, and many others

Part I: How to Program

- 1) Definitions of Architectural Programming
- 2) Issue-Based Programming
- 3) Goals (the promise for quality; what is a goal)
- 4) Performance Requirements
- 5) Concepts

Part II: Applications.

- 6) The scientific method
- 7) Easy research methods for designers
- 8) Advanced research methods for designers
- 9) Environment and Behavior Issues

- 10) Information management
- 11) Formats: Structuring a Program Document
- 12) Case Studies
- 13) Evaluation

Appendices: A) Facts list (checklist); B) Scenario's; C) Definitions)
Glossary + Bibliography + Index. Many illustrations.

Computer Aided Facility Management system (CAFM)

FM:Space is a database system for the facilities manager. It assist in tracking and forecasting by generating pre-defined reports with a variety of options, and allows creation of user-defined reports for advanced needs. It includes:

- Space Management (currently available or existing space)
- Strategic Planning (future needs + 'stacking')
- Property and Lease management (lease agreements and property information)
- Assets Management (furniture, equipment, building systems)

Space management contains current and future information on all rooms and spaces available for occupancy and can be sorted a variety of ways e.g. by building, by floor, by room number, by department, and by type of space. If you are using AutoCAD to maintain space inventory, data will be entered automatically into the Space management data table.

Strategic Management is the forecasting of future space requirements. Strategic Planning features build upon Space Management features, plus a) project future space requirements, and b) model the effect of changes in job function mix, space standards, growth rates, or circulation markups. One aspect of Strategic Planning is stacking, the practice of planning the location of departments in a multi-story building or multiple-building company. FM:Space offers stacking tools in association with the Strategic Planning activity.

Property and Lease Management enables you to manage lease agreements and owned/leased property.

The *Asset Management* activity links CAD drawings to the FM:Space database. It tracks assets such as furniture, equipment, electrical systems, data systems, lighting systems, HVAC systems, mechanical systems, and security systems.

See: **FM: Space User's Guide** - Software by People who know Facilities. 2002.
FM: Systems, 807 Spring Forest Road, Suite 100, Raleigh, NC 27609-9197.
Toll Free (800) 648 8030; Tel: (919) 790 5320; Fax: (919) 790 4321
E: info@fmsystems.com; W: www.fmsystems.com

Smith, P.R., Seth, A.K., Wessel, R. et al (2001), ***Facilities Engineering and Management Handbook***. Commercial, Industrial, and Institutional Buildings. New York: McGraw-Hill. ISBN 0-07-059323-X.

Part 1: Facilities Management

Facility Financial Management; Facility Life-Cycle Process.

Part 2: Facilities Engineering

Planning and programming; engineering and design; construction, modification, renovation and demolition, site restoration; facility operations, maintenance and assessment; codes and standards.

Part 3: Facilities: Buildings and Complexes.

Health Care Facilities; Laboratories; Industrial and Manufacturing Facilities; College and University Facilities; Airports, Governmental Installations, and Prisons; Data Centers;

Chapter 4: Planning and Programming Process. pp 4.3-4.77.

Chapter editor: W.L. Porter. Authors: Sims, W., and Becker, F.D.

Section 4.1: What is programming

Section 4.2 Programming Activities and tools

Section 4.3 Using the Program

p. 4.12: Relay Model vs. Rugby Model

p. 4.19: Structuring the process

p. 4.25: Interviews and workshops

p. 4.28 Gathering information about the context

p. 4.32: The five why's

p. 4.34: Communication with users

p. 4.39: Analyzing the individual user

p. 4.43: Determining building requirements

(footprint, total net building area, total gross building area, gross area estimate)

p. 4.47: Utilization studies

p. 4.48: Adjacency Analysis

p. 4.52: Evaluation methods as programming tools (Cornell Surveys. STM)

p. 4.66: Projection techniques (Delphi, brainstorming)

p. 4.67: Generating design requirements from the data

p. 4.69: Organizing project goals, requirements, and assumptions + prioritizing

p. 4.72: Using the program

5. Human Factors and Ergonomics

Interview with Alan Hedge, October 2004

Professor of Human Factors / Ergonomics, Cornell University, Ithaca, New York.
ah29@cornell.edu and www.ergo.human.cornell.edu
Room MVR E 206; Phone: 607-255-1957 (home 266-0784)

Ergotecture, as a subset of Ecotecture.

Website includes a number of links, e.g.
www.osha.gov e.g. guidelines for nursing homes
The Human Factors Design Standard
Sick Building Syndrome summary
Ergonomic Evaluation of 5 Library Workstations
Computer Workstation Guides
Hospital Ergonomics
Hotel Ergonomics
Ergonomic tools and checklists
Survey forms
Publications of Hedge (1987 onwards)

See for *publications* also the file Word\Becker USA\General references and the International Journal of Facilities management

Design for All

Design for All is not the right term, because it evokes the idea that one solution fits all, and that's not always true. It should be: Access for All, with Design for All as one of the strategies, and if not possible by special facilities. Quality of life is not an issue, the question is: what does it cost and what are the benefits. In the USA the main driver for Access for All is human rights (ADA), steered by layers who can make money out of it. An example: a deaf student in Colorado sued the University, not being satisfied with the person who did the reading of documents! There are regional differences. In Florida where many retired persons live, accessibility is involved in design. After a POE by Alan Hedge, the Cornell Campus store was re-designed to make it more accessible (it still is not).

A new issue is designing in-efficient buildings to force people to move more and thus avoiding or reducing obesity.

Computer Aided Facilities Diagnostics (CAFD)

See: Hedge, A., and Ellis, D.S. (1991), *New graphic database software for managing facilities performance*. IFMA 5th Annual Facilities '91, Computer Aided Facility Management and High-Tech Systems Conference, Washington D.C., May 8-10.

A combination of graphic data, data from compliant files, and statistics from the architect, the facility manager, and occupant surveys, mapped in AutoCAD in different layers: so-called 'smart mapping'. Advantages: visualization of data and the possibility to investigate correlations.. E.g. a comparison between a CAFD screen for complaints of poor ventilation, and a CAFD screen for complaints of eye irritation, with three categories: never; monthly; weekly. Connected by an Intelligent Query System', the "engine" of CAFD-systems.

Keep it simple

Managers don't like complex issues, so keep it simple and use rapid methods: time is money. A comprehensive study is often not welcomed, so look for data that are "good enough". See the medical area: blood pressure is easy to measure and an indicator for health, not completely reliable, but in most cases sufficient. Maybe not the exact number, but in

comparison to earlier and other's measurements. Benchmarking works: give numbers of the 25, 50 and 75 percentiles, e.g. the quartiles for the percentage of men and women reporting weekly perceived Indoor Air Quality conditions (IAQ) as symptoms of a Sick Building.

Questions from Questionnaires

Did you experience each of the following environmental conditions at least once per week during the past month (4 weeks):

Air temperature too cold 0 yes 0 no
Air temperature too warm
Too little air movement
Air too dry
Unpleasant odor in air
Air too stale
Air too dull

Did you experience each of the following symptoms on at least a weekly basis during the past month (4 weeks):

Irritated, sore eyes 0 yes 0 no
Hoarseness
Stuffy, congested nose
etc.

By giving quartiles, a company can judge if it is on the top or below average.

Decision support software

For instance Jack, ergonomic software available on the market. But it is very expensive and you need time to get familiar with it.

6. Real Estate Two-Year Master's degree Program

www.realestate.cornell.edu

Interview with Robert H Abrams, Senior lecturer – October 26, 2004

Rha3@cornell.edu T: (607) 255 1748; 112 W Sibley Hall

Former director of Real Estate. Present director Brad Olson, almost 6 years, so they are looking for a new one.

A free standing program, a 'field', not a College or Faculty. Student enrollment 20 students each year, with different backgrounds (Architecture, MBA), most of them with working experience. Average age about 30 years. 50% from overseas, particularly Asia.

Housed in the Faculty of Architecture, but not linked to them. Not in Johnson School of Management (just a business school).

Co-operation all over Cornell, e.g. with Becker, Stattler Hotel School (course in Real Estate Finance). Most courses are taken by students from different programs.

Most faculty staff have an appointment in another school and do their research there, so not much particular research is done in Real Estate. No PhD research at all (yes in University of Washington; Berkley, California; Georgia, Atlanta).

12 core courses

Principles of Real Estate; Real Estate Finance and Investment; Real Estate Development Process; Real Estate Marketing and Management; Real Estate Industry Seminar Series; Real Estate Project Workshop; Residential Development; Design in Real Estate Development; Construction Planning and Operations; Public and Spatial Economics for Planners; Real Estate Law; Managerial Finance; Leadership and Management Distribution.

8 concentrations

Real Estate Investments; Real Estate Development; Sustainable Development; Real Estate Finance and Investment Banking; Real Estate Consulting; Property and Asset management; Real Estate Marketing and Market Analysis; International Real Estate.

At Cornell; Real Estate is about TRANSACTIONS. Focus on: is there a market for it, what are the different ways of financing, should I buy or lease, security, investment trust, mortgage, law and legislation. Also on use, with issues such as people's shopping behavior, demographics. Not particularly involved in CRE. Construction management is part of Civil Engineering.

Most housing is for sale, not for investment.

Interesting part of the curriculum: workshops with students working in teams of 4 Real Estate and 2 Architectural students. One of the topics: rehabilitation of center cities such as Baltimore or Denver.

Employed by developers, consultancy firms such as Ernst & Young or Price Waterhouse Coopers, banks, insurance companies etc..

Hot items e.g. implications of private companies going public (openness of data!).

Most other universities: just one year (MIT, 25 year old, in the Planning Department), Columbia, Wisconsin (one of the oldest). In Pennsylvania part of an MBA. Elsewhere also small (35 students per year).

7. The School of Hotel Administration

www.hotelschool.cornell.edu

174 Statler Hall, Ithaca, NY 14853-6902

Interview with Stephani Robson, Lecturer, October 25, 2004

Lecturer, Hotel School Hospitality Fac. Opr.; 182 Statler Hall; Skr4@cornell.edu;
T: 607 255 6852; Research interest: restaurants.

About 800 undergraduates (160 freshmen and 35 transfers in each of the four years).
About 115 graduate students.

Focus on managing and use, less on creating design. Looking for a balance between theory and application; in the eighties hardly any research, but a focus on practice; nowadays more interest in research (since the new dean). Themes e.g. environmental psychology, proxemics, lighting, decision tools, and contract management (owner, contractor, architect; pricing agreements). Graduation is not very research oriented, more like business schools; writing a thesis is not required. Most PhD's start teaching in a hospitality school or Business school.

Owner of a hotel is not the person who is running it, so there are two streams of interest. Branding is extremely important. Factors: the name of the hotel, the operator, and the building.

Adaptive reuse of buildings and historic preservation is an issue, but not as strong as in the Netherlands or in Europe.

Focus on the whole building cycle, but not as much on construction and on project management (field of the School of Engineering).

Curriculum

23 courses in hotel administration; 4 elective courses from 150 offered at the Hotel School; 6 courses in the liberal arts; 6 more elective courses in any of Cornell's seven undergraduate schools and colleges.

Nine major areas: Communication; Economics; Financial Management; Food and Beverage Management; Management Operations and Human Resources; Marketing and Tourism; Operations Management and Information Technology; Law; Property-Asset Management.

No courses in how to program a building, just to understand what a program of requirements is, how to interpret a program and how to test building plans.

Most disciplines come from inside, but the Hotel school also co-operates with staff from other Cornell schools.

Hotel School Facilities

Statler Hotel; J Willard Marriott Executive Education Center; Food Laboratories; Library; Binenkorb Computer Center; Vance A Christian Beverage Center.

Centre for Hospitality Research

www.hotelschool.cornell.edu/chr

Sponsored programs with much freedom what and how to investigate. Often too theoretical. Financial support: Friend of the Center Program \$ 5,000; Partner \$ 25,000 per year; Sponsor \$15,000 per year.

8. Faculty of Architecture, Art and Planning (AAP)

www.aap.cornell.edu

B1 West Sibley Hall, Ithaca, NY 14853-6701

"With an emphasis on studio-based work and teachings, students are pushed to apply their knowledge in an environment where faculty and visiting scholars provide field-specific guidance." - Rob Profusek 2003

Cornell's smallest college offers three majors: architecture, fine arts, and urban and regional studies. The total enrollment of the College is about 740 students. The undergraduate degrees offered: Bachelor of Architecture, a five year professional degree, Bachelor of Science in the history of architecture, a two year upper level transfer program, Bachelor of Fine Arts, & Bachelor of Science in urban and regional studies.

The **Department of Architecture** has about 315 undergraduate students, 50 graduate students, a full-time resident faculty of 30, and 6-10 visiting faculty. The intensive, five-year architecture program graduates about 65 students each year. As undergraduates, they spend the bulk of their time in the Rand Hall studios, with a view of the Triphammer Falls.

The construction of Milstein Hall where Rand Hall now stands is scheduled for completion in 2006. The new building will provide classrooms and studio spaces for the Department of Architecture. (for more information, see news & events, new building updates)

Courses attractive to students throughout the university include Introduction to Architecture and History of Architecture. Seminars and lectures by architecture faculty members are enhanced by a strong visiting critic program.

Special lectures such as the Preston Thomas Memorial Lecture Series, exhibitions in the Hartell Gallery, and the award-winning Cornell Journal of Architecture broaden the educational experience.

The Architecture Instructional Computing Lab offers a significant component to the curriculum. The Visual Resources Facility/Slide Library, one of the oldest and largest in the country with 430,000 slides, and the Sibley Fine Arts Library, which is among the top academic art libraries in the nation, are vital resources.

The Rome Program and Summer Abroad Program, study abroad opportunities for upper-level students, prepare them for professions that are becoming increasingly international. Through electives, the humanities and sciences constitute one-third of the program.

Student organizations: Architecture Graduate Student Association (AGSA), Minority Organization of Architecture, Art, and Planning (MOAAP), National Organization of Minority Architects.

History

1871

In 1871, three years into his tenure as the first president of Cornell University, Andrew Dickson White proposed to give his architectural library, his "pet extravagance," to the university in return for the creation of a department of architecture. The trustees approved, and appointed Charles Babcock as the first professor of architecture in the United States.

1876 - early 20th century

The new architecture program was immediately popular, registering 32 students by 1876, and enrolled its first international student, Noriyuki Kozima of Japan, in 1879. Margaret Hicks (A.B. 1878, B.Arch. 1880) was the first woman to graduate from an architecture course in an American university. Under Francke Huntington Bosworth Jr., who came to Cornell in 1919 as professor of design and dean of the College of Architecture, Cornell became the first architecture school to extend its curriculum to five years.

1960s

The 1960s saw the addition of a graduate program in urban design. In 1962 Colin Rowe began nearly three decades of teaching architecture at Cornell; he was awarded the 1995 Royal Gold Medal for architecture as "the most significant architectural teacher of the second half of the twentieth century."

1974

The Computer Graphics Research Center, supported by a grant from the National Science Foundation, opened in Rand Hall in 1974 under the directorship of Donald Greenberg.

1986

The College of Architecture, Art, and Planning launched the Rome Program, which would become a vital component of architecture education at Cornell.

Today

Today the Department of Architecture enrolls about 315 students in a highly competitive and highly regarded program. In an independent study, principals of over 150 leading U.S. architecture firms were asked which schools had educated their best employees; Cornell was ranked number one in 1999, 2000, and 2001.

Notable alumni

Cornell architecture counts among its prominent alumni, in both practice and academia, Richard Meier, Nathaniel Owings, Peter Eisenman, Arthur Gensler, Mui Ho, Jill Lerner, Suzie Rodriguez, Marlene Davis, Alan Chimacoff, Werner Seligman, Suzie Kim, Fred Koetter, Rem Koolhaas, Tom Beebe, Enrique Norten, Alex Kreiger, Earl Flansberg, Michael Manfredi, Steven Hurtt, and Jorge Rigau, to name but a few.

Facilities

The Department of Architecture is centrally located in Sibley and Rand Halls, on Cornell's historic Arts Quad. At one end, Sibley is adjacent to Tjaden Hall, the art department building, which in turn is near the Herbert F. Johnson Museum of Art, designed by I. M. Pei and offering a strong, varied collection and a continuous series of high-quality exhibitions. At the other end Sibley is directly next to Lincoln Hall, the just-renovated and expanded building for the music department. The long front side of Sibley faces onto the formal Arts Quad, the back onto the natural landscape of Fall Creek Gorge. A new architecture building, Milstein Hall, is currently being designed to replace Rand Hall.

DESIGN STUDIOS AND SHOP

Most of the department's design studios are located on the second and third floors of Rand Hall, with a few in Sibley. All students in studio have dedicated space, drafting table and stool for their exclusive use during the semester and access to the studio 24 hours a day, seven days a week. The architecture shop is located on the ground floor of Rand Hall, convenient to studios on the floors above. Besides standard power tools for working with wood and metal, it includes a sophisticated laser cutter for precision cutting of wood, metal, plastic, and other materials. Cornell is one of only a handful of schools nationwide that possess laser cutters. Students at all levels of the program make extensive use of the shop and are introduced to its equipment almost from day one of first-year studio. Students are carefully trained before being allowed to use any of the equipment. This training, combined with the constant vigilance and supervision of the shop manager, has ensured an impressive safety record.

COMPUTER FACILITIES

The architecture department's primary computer facilities for general use by its undergraduate students are located in two rooms on the second floor of Rand Hall, directly adjacent to the design studios. There are approximately 60 Macintoshes and PCs, which are upgraded annually with hardware and software to ensure that the facility provides the latest equipment and opportunities for learning and instruction. The labs are open 24 hours a day, seven days a week.

CORNELL INFORMATION TECHNOLOGIES

CIT, the central information technology organization, offers many different services to make using technology easier for newcomers. CIT can be contacted at www.cit.cornell.edu/computer/ or by phone at the HelpDesk, 255-8990. Students at Cornell use a network access package called Bear Access to connect to standard Internet services such as e-mail and the Web and specific Cornell offerings such as the library's online catalog and CUinfo, the campus-wide online information system.

FINE ARTS LIBRARY

The Fine Arts Library in Sibley Hall includes 177,000 books and 1200 periodicals. There are 17 other libraries on the Cornell campus for books and other reference materials on any subject. There is an online catalog and extensive system of electronic databases.

KNIGHT VISUAL RESOURCES FACILITY

Also in Sibley, the Knight Visual Resources Facility contains over 430,000 slides that provide instructional and research support for programs of the College of Architecture, Art, and Planning and the History of Art Department within the College of Arts and Sciences. The contents of the collection reflect the teaching interests of the faculty, with strong holdings in architecture, art history and contemporary art. Approximately 5,000-8,000 images are added annually.

HARTELL GALLERY

Student, faculty, and professional work in architecture is regularly displayed in Sibley's Hartell Gallery, which was completely renovated during the summer of 2000. The architecture department's web site is also beginning to be used to display student work.

Appendix 1: Web-research

ABI/Inform

An international business and management database; abstracts of articles / 800 publications.

ProQuest

Database of actual articles

DIALOG's databases

A collection of 150 databases, including Business Connection, Business Information, and Company Information

Workindex.com

→ Workplace: 378 hits

info over labor, women, health and safety, HRM, abuse, accessibility

1) BetterWorkplaceNow.com

19) www.winningworkplaces.org

Winning Workplace Ideas eNewsletter Vol. 3 no. 8:

Productive Environments: A conversation with John Clark of Architectural Firm Cordogan, Clark and Associates

- Opinions of the author;
- Statement: 30 inch high desks good for working with pencil and paper, too high for keyboards)

Winning Workplace Employee Opinion Survey: helps an organization to diagnose it's strenght and weaknesses; 6 core values: trust; respect and fairness; open communication; rewards and recognition; learning and development; work/life balance.

Hewitt study: "Preparing for the workforce for tomorrow" (opinions and practice of 27 major corporations}; 29% increase in 45-64 year old people in the workforce by 2010 + 14% increase in those over the age of 65; in 2008 70% of the new labor force nentrants will be women and minorities;

13) **International Workplace Studies Program (IWSP)**

iwsp.human.cornell.edu

22) Workplace Diversity Network

www.ilr.cornell.edu/extension/wdn

co-founded by Cornell University's School of Industrial and labor Relations and the National Conference. Focus on inclusive workplace design.

25) **Workplace Forum**

www.workplaceforum.com/user

research and learning network focused on global best practice in workplace design, technology and management;

info only available to Workplace Forum members;

corporate membership.€ 1000,-/year

facilitated by DEGW (www.degw.com)

Info Europe Emily Smith, esmith@degw.com

26) Workplace Health Strategies Bureau

www.hc-sc.gc.ca/hecs-sesc/workplace/index.htm

Health Canada: creation of safe, healthy and supportive work environments.

63) **The Institute for Workplace Studies**

www.ilr.cornell.edu/iws/

based in New York City; created in 1999;

issues e.g. drinking behavior at work, ADA etc.

ILR = Cornell University School of Industrial and Labor Relations

87) Center on Education and Work

93) Confined Space

www.spewingforth.blogspot.com

issues: health and safety at work

110) Ergonomics, Technologies Corporation (ETC)

ergonomic services, training and education

115) Health and Safety at Work: Directorate General of the European Communion

152) [Safety@work](#) (3 consulting firms)

158) The changing face of the 21st Century

212) Computers and Health

229) Ergoweb Inc., the place for ergonomics

251) ILR Press – Cornell University Press: www.cornellpress.cornell.edu/cup_series.html

281) National Study of the Changing Workforce

374) Usernomics: www usernomics.com

standards, books on ergonomics, ADA

378) Work Life Balance

www.niwi.knaw.nl/en/oi/nod/onderzoek/ond1295764/

Efficiency indicators for the building board / doelmatigheidsindicatoren Bouwcollege

Institute for research on Public Expenditure

Projectleader P.H. Eshuis, Italiëlaan 33, 2711 VCA Zoetermeer

www.ioo.nl info@ioo.nl

o.a. Van Ingen (2001), Arbeidsproductiviteit in onderwijs, onderzoek en cultuur.

Find databases

→ Business/Labour/Management

- Labor, employment and managing human resources

Polachek, S.W. (2004), *Accounting for worker well-being*. Amsterdam/Boston: JAI.

Schein, E.H. (2004), *Organizational culture and leadership*. San Francisco: Jessey Bass. 3d edition.

find **articles (>1990) -> workplace design:** 48 hits

- Mawson, A. (1994), Benefits, Costs and the Workplace Design process. *Facilities* (12) no.8, 15.
- Chigot, P. (2003), Controlled transparency in workplace design. Balancing visual and acoustic interaction in office environments. *Journal of Facilities Management* (2) no. 2, 121-130.
- Roelofsen, P. (2002), The impact of office environments on employee performance. *Journal of Facilities Management* (1) 3, (2002), 247-264.
- Tricket, T. (1991), Workplace Design, its contribution towards total quality. *Facilities* 9, no. 10.
- Ebben, J.M. (2003), Workplace Ergonomics Supplement Occupational Health and Safety, 72, no. 4, 72 (about standing work).

Design experts shed light on workplace performance measures. In: Site selection & industrial development (45) no.4, July 2000, 644.

Design your lab for tomorrow. Research & Development (46) 5, 2004, 28.

Interior Design and Space Planning. June: Buildings (92) no.3, March, 1998, 34., the magazine from CIMA (febr. 2003), 20.

Office Design. In: Financial Management

Workplace Design Compatibility for Today's Aging Worker. Journal of Industrial Teacher Education, 36, 3, spring 1999, 53.

Find **articles (>1990) -> costs and benefits:** 50 hits

- Voordt, Theo JM van der (2004), Facilities.
- Becker, N. (2004), The benefits and costs of noise reduction. *Sage Urban Studies Abstract* 32 no. 1.
-

Find articles (>1990) -> non-territorial offices: 2 hits

- Becker, F. (1992), Managing space efficiently, non-territorial offices and universal plan offices. *Property Management*, 10, no. 3.
- Becker, F. (1993), The ecology of new ways of working. *Site selection & industrial development*, 38, no. 1, February, 147.
-

Find **articles (>1990) -> productivity:** 50 hits

- OECD Economic Surveys Netherlands: Policies to enhance innovation and productivity growth. In: OECD Economic Surveys, 2004, no. 9, 253: 291.
- Wyan, D.P. (2004), The effects of indoor air quality on performance and productivity. *Indoor Air*, 14, no. s7, 92-101.
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Find **articles (>1990) -> creativity:** 50 hits

- Mahboub, K. et al (2004), Measuring and enhancing creativity. *European Journal of Engineering Education*, 29, no. 3, 429-436.
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Summary

Horgen, T.H., M.L. Joroff, W.L. Porter and D.A. Schön (1999), *Excellence by Design*. Transforming Workplace and Work Practice. New York: John Wiley & Sons.

Proven strategies for creating the workplace of the future.

Work done by the Space and Organization Research Group (SPORG) of the Massachusetts Institute of Technology's School of Architecture and Planning, MIT (John Habraken, Sandra Howell, Jacqueline Vischer et al)

A new approach to creating workplaces: conceptual framework of process architecture

H4: game metaphor, description of the design game and how to play it.

H6: communication + team-based learning <-> creating new products

p.9: four dimensions of the workplace: space, organization, technology, finance

p. 11: different competencies need to communicate to optimize the workplace

p. 16: efficiency, flexibility, visibility, control. 48c: technical-rational approach / participatory approach / co-design approach

p. 48f: tasks and challenges of process architecture

Summary

Becker, F., and Sims, W. (1987), *ORBIT-2*. Orientation Session. Ithaca: Facilities Research Associates, Inc. & IBM, Endicott, NY.

Requirements of a tool: transparent process; easily modified over time by different users; movement from one tool to another should require minimum translation or transformation; simple to use; focus on most important issues; concern with process as well as product.

17 Key Issues: 1-9 = organizational; 10-17 = technology

1) Change of total staff size; 2) Attract or retain work force; 3) communication of hierarchy, status, and power; 4) relocation of staff; 5) maximizing informal interaction; 6) human factors in the ambient environment; 7) image to outside; 8) security to outside; 9) security to inside; 10) connecting equipment; 11) changing location of cables; 12) environmentally demanding equipment; 13) protecting hardware operations; 14) demand over power; 15) relocating heat producing equipment; 16) human factors: workstations; 17) telecommunication to or from outside.

Organizational classification: low vs. high change, and routine vs. non-routine.

Including an excerpt of the organization survey -> graphic profile of the building's performance on the 17 key issues. Ditto of Design strategies.

The issue is not: maximizing building performance; it is matching building performance to organizational needs.

Application area: purchase decisions and negotiations; leasing decisions and negotiations; renovations; design; space planning.

Summary

Dolden, M.E., and Ward, R. (1985), ***The Impact of the Office Environment on Productivity***. Proceedings of the Architectural Research Center Consortium Workshop. AIA, Washington D.C.

Architectural Research Center Consortium, Inc.
1735 New York Avenue, NW, Washington D.C. 20006.

Contributions of Franklin Becker, Alan Hedge, Michael Brill, Robert Sommer, Peter Jockusch, Jacqueline Vischer, Peter Ellis, Volker Hartkopf, John Zeisel, Michael Joroff, Eric Sundstrom, Peter Margulis (BOSTI), Daniel Stokols, and others.

Summary of Becker's ***Work in its physical context; the politics of space and time***.

Becker pleads for identifying and challenging our working assumptions, the "hidden program". Taylor's assumption that the major impediment to productivity lay in our physical work capacity led to his emphasis on work physiology and ergonomics. The belief in the right of individuals to influence decisions affecting their lives will lead to research with employee participation at its core. Believing that willingness to work is as important as capacity may lead to a focus on social and physical conditions that contribute to motivation, commitment and involvement.

Items for reflection: the role of the researcher; nature of evidence (the issue is not rigor vs. non-rigor, but how far to go with our sophisticated statistical analysis and research design: is it appropriate to our level of understanding?); research collaboration.

Social and organizational items with implications for research (1985!): flexibility; efficiency; hierarchy; standardization; beauty; nature and type of group work; IT and organizational change; physical proximity, communication, and performance; time/space scheduling; spatial separation or integration of top management; individual, group, and multiple workspaces; furniture and space allocation policy; management of environmental change; individual, social, organizational, and community implications of work at home and in other non-central locations such as neighborhood work centers; ditto of organizationally-provided amenities; facility management; control; symbolism (the environment as a communication medium vs. the one-sided focus on function, ergonomics and task instrumentally).

Productivity vs. effectiveness and "performance". Performance implies something broader than productivity's input/output model and can more easily accommodate diverse outcomes such as communication patterns, group cohesiveness, morale, initiative actions, complaints, quality of work, health records, temporary absenteeism, job acceptance, cultural powerful work-related attitudes, environmental perception, organizational commitment, satisfaction scores, and process effects, as well as traditional performance measures concerned with amount and speed of input and output. The theatre metaphor suggests the workplace as a stage, workers as actors, and the total set of activities engaged in as the performance. The overall success of the play depends not on single isolated performances, but on the integration of all the player's performances, including the unseen players responsible for stage design, lighting, and the direction of the play itself! We should investigate both building performance and human performance.

Shifts in methodological approaches: more qualitative and descriptive data; less emphasis on satisfaction per se; more observational data of actual behaviors; more field experiments; more use of archival data; more use of physiological data; greater use of multiple measures.

Summary of Robert Sommer's contribution on ***The Measurement of Productivity***

It is objective gains in output (better learning performance in schools, getting well faster in hospitals, office workers achieving more in their new offices etc.) and not user response or user satisfaction that is the issue.

Models for Proving Productivity Gains:

- 1) Presumptive model: demonstrating improvements in morale or satisfaction and assuming that these will be related to productivity gains.
- 2) Correlation model: comparing productivity or efficiency records among organizations that differ according to selected environmental factors.
- 3) Experimental model: comparing productivity or efficiency records for individuals or groups assigned randomly to different experimental conditions.
- 4) Monetizing model: measuring satisfaction or work variability as they relate to environmental conditions, and translating these into dollars using economic projections ("dollar-metrics").

Sommer pleads for a combination of all and emphasizes the need for more dollar-metrics and discusses advantages and drawbacks. Note: there is an important difference between translating something to dollar terms and reducing it to dollar terms!

Implications of the discussion and reflections:

- 1) Not every design feature needs to be monetized even though this is technically possible.
- 2) For those design features of the workplace which lend themselves to monetization, a dollar metric can bring increased comprehensibility to occupants and increased acceptance of recommendations by clients.
- 3) Although economists are professionally trained to undertake monetization, it may not be possible to secure the services of an economist on a particularly project. Most of them are far more interested in macro economic issues with broad regional, national, or international significance than in setting dollar values on aspects of the proximate environment. Where economists are unwilling to assist, the task becomes by default the responsibility of design researchers.

Summary of Jean Wineman's contribution on ***New Developments in Office Setting Research***.

A review of her own research and other research.

p. 72: Overview of office hazards (discomfort, fatigue, RSI, noise, stress, poor Indoor Air Quality etc.)

p. 82: Review of conclusions from the Buffalo Organization for Social and technical Innovation (BOSTI) e.g.:

- High enclosure supports privacy "and" communication.
- High enclosure relates to high satisfaction with amount of space (so openness doesn't make a space seem larger).
- Higher noise (to a limit) makes communication easier.
- Yet noise (from ringing phones, conversation, hum of ventilation systems result in lower job satisfaction.
- Workers prefer windows, but window's don't seem to affect satisfaction or productivity (Korman, 1984).
- The BOSTI study is the first major study to associate dollar values with particular design improvements, so that cost-benefits and payback periods can be calculated.

p. 82: ORBIT: Office research Into Buildings and Information Technology, by Duffy Eley Giffone Worthington (DEGW) architects and space planners, Eosys (office automation consultants), and Building Use Studies (Peter Ellis et al).

p. 84: A focus on energy conservation without consideration for the broader ramifications of such decisions as air tightness or reduced ventilation rates has led to examples of building performance failures. Hartkopf and Loftness (1983) plea for a "transdisciplinary" understanding of effects of total building performance., including building integrity. Thermal comfort, acoustic comfort, visual comfort, air quality, and spatial comfort. Each of the building performance mandates has a "comfort zone" setting limits of acceptability for the particular occupancy type.

p. 86: discussion of computer-based Building Performance Database

Summary of Jacqueline Vischer's contribution on ***A Conceptual Framework for Buildings-In-Use***. The merging of Objective and Subjective Approaches to Building Performance Assessment.

Discussion of the existing "objective" paradigm (measuring of effective ventilation rates, CO₂ levels, relative humidity, temperature, air speed, task and background luminance, and sound pressure levels, and comparison with present standards) vs. an alternative paradigm for building-in-use studies (using "subjective" rating scales for seven dimensions of human comfort: air quality, thermal comfort, noise intrusion, spatial comfort, privacy, lighting level, and delighting. One of the implications is that user-oriented solutions instead of building-oriented solutions be considered to solve building problems.

Summary of Peter Ellis' contribution on ***A Functional, Disaggregated Approach to office Productivity and Environment***.

p. 130: classifying office work in a matrix with in the columns: managerial professional technical; secretarial clerical; and in the rows: policy making; creative information processing; routine information processing.

p. 134: links of the class of work with concentration need (individual; group), interaction need (spontaneous; planned), and electronic content; high/medium/low.

p. 135: Productivity indicators e.g.

a) Routine information processing: quicker response to customer inquiries; quicker document production or turn-around time; efficient diary-keeping or work scheduling; efficient formal communications. Prime environmental needs are: functional support at the workstations; integration of facility and personnel management; recreation.

b) Creative information processing: design product quality; meeting project guidelines; group task achievement; individual document creation. Prime environment issues are space planning and room layout, and servicing.

c) Policy making: smarter decision making; finding people when you want them; useful encounters; successful negotiations. Key environmental issues: private meeting rooms; building configuration and layout; symbolic aspects of environment

Miscellaneous

p. 173: Sundstrom. Three inter-related levels of analysis: individual, interpersonal, and organizational. p. 176: Associated features of the physical environment, dynamic processes, and outcomes. p. 178: Environmental influence on performance, job satisfaction,, health, symbolic communication and so on.

p. 376: *Agenda of priority issues* (1985)